EFFECT OF SELECTED CHEMICALS ON INDIANA BATS, GRAY BATS, AND BALD EAGLES AT FORT LEONARD WOOD, MISSOURI

APPENDIX IV TO THE
BIOLOGICAL ASSESSMENT:
RELOCATION OF U.S. ARMY CHEMICAL SCHOOL
AND U.S. ARMY MILITARY POLICE SCHOOL
TO
FORT LEONARD WOOD, MISSOURI

Submitted to:
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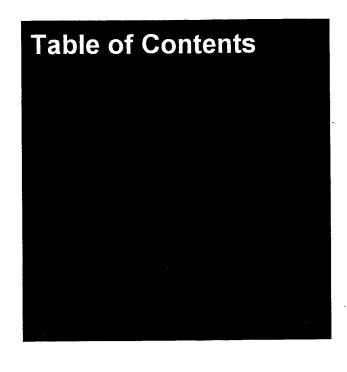
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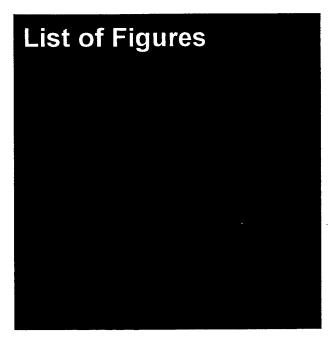
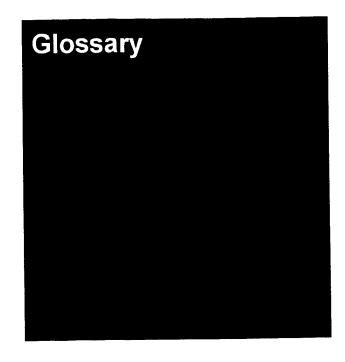


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Α

ACUTE EXPOSURE - A single exposure event

AEROSOL - A gaseous suspension of fine solid or liquid particles

ALIPHATIC - A molecule with a straight chain structure

ALKANE - A hydrocarbon having only single bonds

ALKENE - A hydrocarbon having one double bond

ALKYNE - A hydrocarbon having one triple bond

ALLUVIUM - Clay, silt, sand, gravel deposited by running water during recent geological time, ordinarily on floodplains of streams or at places where streams lose velocity.

AMSL - Above mean sea level

ANAEROBIC - Without air, in the absence of free oxygen

ANOVA - Analysis of variance; statistical analysis of two or more samples that tests variance among samples and interaction between samples.

ANTICLINE - An upfold or arch of stratified rock in which the beds or layers bend downward in opposite directions from the crest or axis of the fold.

AROMATIC - A molecule with ring structure

ASSESSMENT ENDPOINT - A quantifiable expression of the environmental value considered to be at risk

AUGER - A drill-like tool used to collect core samples of soil

В

BAF (Biological accumulation factor) - ratio of the concentration of a chemical in media to that in tissue

BCF (Biological concentration factor) - ratio of the concentration of a chemical in water to that in an aquatic organism

BIOACCUMULATION - The net accumulation of a chemical by an organism as a result of uptake from all routes of exposure

BIOAVAILABILITY - The proportion of an orally ingested substance that is absorbed into systemic circulation

BIOCONCENTRATION - In aquatic habitats, the net accumulation of a chemical by absorption from aqueous solution

BIOMAGNIFICATION - The accretion of substances as a result of food chain relationships

BOD₅ (Biological oxygen demand) - The amount of oxygen required to oxidize chemicals in a water sample by biological mechanisms

C

CANOPY - The top-most layer of plant growth

CHRONIC EXPOSURE - Multiple or repeated exposure events

CHRONIC REFERENCE DOSE - An estimate of daily exposure that is likely to be without appreciable risk of adverse effects during a lifetime

COD (Chemical oxygen demand) - The amount of oxygen required to oxidize materials in a water sample by chemical mechanisms

COLLUVIAL - Sedimentation of or deposition of particulate matter by the force of gravity

COMMUNITY - A collection of different and interacting populations within a specified location

CONCEPTUAL MODEL- A model (format) design that describes a series of working hypotheses of the manner in which a stressor may affect ecological components

CONDUCTIVITY - The capacity to propagate electrical charges

CONDUIT SYSTEM - In geology, a network of drainage passages for ground water.

D

DBH (Diameter at breast height) - the diameter of a tree measured at breast height

DECIDUOUS - A tree that sheds leaves or fruit at the end of a growing season

DEFORMATION - The process whereby rock is folded, faulted, sheared, or compressed by earth stresses

DIRECT EFFECT - (Ecological Risk Assessment Definition) An effect where a stressor acts on the ecological component of interest itself, not through effects on other components of the ecosystem

DISSECTED LAND - Land divided into hills and ridges by valleys and gorges

DISSECTION - The process of erosion whereby a land surface is cut by gullies, ravines, canyons, or other kinds of valleys

DISTILLATION - Separation of components in a solution by volatilization followed by condensation

DRAW - In geology, a low-lying area

DRIPLINE - Edge of a cave entrance where water runoff falls

Ε

EVENESS INDEX - An index describing the number of organisms in each species of a community, which gives an indication of diversity of the community

EXPOSURE PATHWAY - The course and mechanism by which a chemical agent transfers from a source to an exposed organism

EXPOSURE PROFILE - Characterization of exposure in the analysis component of ecological risk assessment for the receptor and stressor

EXPOSURE ROUTE - Part of an exposure pathway describing how a chemical comes in contact with an organism (i.e. oral ingestion, dermal absorption, or inhalation)

EXPOSURE - Contact between a stressor and an ecological component

F/G

FLASH POINT - The minimum temperature at which a substance will ignite

FOOT SLOPE - A shallow rise in terrain at the base of hills or mountains

FORD - A shallow, usually narrow part of a river that can be crossed by man or animal by wading.

GC/FID (Gas chromatography/flame ionization detection) - Methods used to separate and identify components of a sample

GC/MSD (Gas chromatography/mass spectrum detection) - Methods used to separate, identify, and quantify components of a sample

Н

HARDNESS - Measure of calcium and magnesium salts dissolved in water

HAZARD INDEX - The sum of more than one hazard quotient for multiple stressors and exposure pathways

HAZARD QUOTIENT - Ratio of actual or predicted exposure concentration to concentration expected to have no adverse effect

HAZARD - A physical, chemical, or biological entity that has the capacity to cause harm

HC (Hexachloroethane; perchloroethane; carbon trichloride) - a type of smoke/obscurant used in pyrotechnics and smoke devices; solvents; explosives

HIBERNACULA - Cave or other site used by hibernating bats

HYDROCARBON - An organic compound consisting of carbon and hydrogen

HYDROLYSIS - Decomposition of a chemical compound brought about by reaction with water

HYDROTREAT - To chemically reduce a molecule by breaking double bonds and adding hydrogen atoms

I/J/K

INDIRECT EFFECT- (Ecological Risk Assessment Definition) An effect where a stressor acts on components of the ecosystem that in turn have an effect on a species or other component of concern

INTAKE - A measure of exposure expressed as the mass of a chemical substance per unit body weight of exposed organism per unit time

INVERSION LAYER - A layer of warm air that is trapped below a layer of cool air

IRIS (Integrated risk information system) - A database sponsored by the EPA that contains verified health risk information for numerous chemicals; a primary source of toxicity information for Superfund

ISOPLETH - Line of equal concentration; a line on a graph indicating stressor concentration at varying distances from the source

JACARD SIMILARITY INDEX - A measure of symmetry between 2 communities based on portion of species common to each community to the total number of species found in both communities

Kow - Octanol/water coefficient

L

LC₅₀ (Lethal concentration)-The concentration of a liquid or gas that is lethal to 50% of a population in experimental testing

LD₅₀ (Lethal dose)- The dosage (oral) of a substance that is lethal to 50% of a population in experimental testing

LEACHATE- Soluble material removed from soil by percolating water

LENTIC- Flowing waters such as streams, rivers and creeks where water turbulence maintains most solids in the water column

LOAEL- Lowest observed adverse effect level

LOTIC - Pooled areas in any body of water where flow is slow and suspended solids fall to the bottom, especially ponds, lakes and reservoirs

М

MATERNITY COLONY - A group of reproductive female bats that gather at one roost to give birth and raise young

MEASUREMENT ENDPOINT - A measurable biological or ecological characteristic

MESIC - Characterized by a moderate amount of moisture

MESOPHYTES - Plants that grow under medium conditions of moisture

MOTTLED - Having patchy or spotted coloration

Ν

NOAEL - No observed adverse effect level.

NON-CARCINOGEN - A substance which does not cause cancer

NON-SYSTEMIC - Affecting portions of the body other than the organ systems

0

OBSCURANTS - Opaque smokes or mists used to obscure troops and equipment

ORGANOCHLORINES- Chemicals containing atoms of carbon and chlorine; often used as pesticides

Р

PARAFINS - A group of saturated hydrocarbons

PARTURITION - Giving birth

PASQUILL STABILITY CATEGORY - An index of atmospheric disturbance, ranging from very unstable air to stable air

pH - Index of acidity of a solution; measurement of the number of hydrogen ions in solution

PHOTOLYSIS - Chemical decomposition resulting from the action of light

PLUME- Pattern of aerosol dispersion

POLAR - An uneven distribution of charges in a molecule

PRE-SETTLEMENT VEGETATION - Condition and composition of the forest prior to fragmentation and logging by modern man

PREVAILING WIND- Predominant wind direction at a locality

R

RCRA - Resource Conservation and Recovery Act of 1976

RECEPTOR - Organism exposed to the adverse effects of a stressor

REFERENCE DOSE (RfD) - A toxicity value for evaluating non-carcinogenic effects resulting from exposure to chemical or physical agents

RESIDENCE TIME - The time a given amount of substance remains in a designated compartment of a system

RESIDUUM - Remainder of sediment or precipitate.

RIPARIAN ZONE - Vegetation growing in the floodplain of a stream or river.

RISK - Adverse effect; hazard

RISK ASSESSMENT - Process that evaluates the likelihood of adverse effect due to exposure/contact with a stressor

SAFE CONCENTRATION - A concentration of a substance a receptor can be exposed and no adverse toxicological effects are expected to result to the receptor

SHANNON-WEINER DIVERSITY INDEX - A calculation that considers the number of species and abundance of each species to provide an index of species richness in a particular community

SHORT-LEAF PINE PLANTATION - A planting of Pinus echinata.

SOIL ASSOCIATION - A group of defined and named soils usually having different characteristics and regularly associated in a geographic pattern.

SOLUTION CAVITIES - A cavern eroded by rain water or slightly acidic ground water along joints or other opening in rock.

SPRING RECHARGE AREA - The drainage basin or area that contributes water to a spring.

SPSS - Statistical Procedures for Social Sciences

STAGING - Post-hibernation, pre-migration of bats near the hibernaculum

STRESSOR- Any physical, chemical or biological entity that can induce an effect which is usually adverse

SUCCESSION - The change in composition of an ecosystem as competing organisms and especially plants respond to and modify the environment leading to a relatively stable community

SUMMER NURSERY HABITAT - Habitat suitable to support reproductive females and neonates

SUPERFUND - The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA); a law that governs cleanup of hazardous waste sites

SWARMING - Pre-hibernation activity of bats near the hibernaculum during which most mating occurs

SYNCLINE - A trough of stratified rock in which the beds dip toward each other from either side

T

T-TEST - Statistical calculation that determines degree of similarity between two samples

TERATOGEN - Substance capable of causing birth or developmental defects

THRUST FAULT - A reverse fault in which the angle between the horizontal and the plane is small

THRUST-BELT - A series of thrust faults

TOXICITY BENCHMARK - Base level against which other toxicity levels are compared

TPH - Total petroleum hydrocarbons

TRELLIS DRAINAGE SYSTEM - Network of streams that drain perpendicularly into larger streams, usually formed between ridges of rock

TROPHIC HIERARCHY - A functional classification of taxa in a community that is based on feeding relationships: the sum of all levels in the food chain or web

TROPHIC LEVEL - Position of a species in the food chain or web

U/V/W

VOLANT - Able to fly

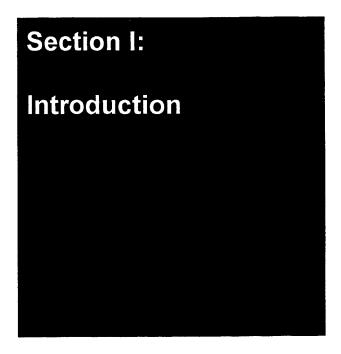
VOLATILE - Evaporating rapidly at normal temperatures and pressures

WINTER-SUMMER REVERSAL - Shift in the direction of air flow near a cave entrance caused by a seasonal change in air temperature outside the cave

X/Y/Z

XEROPHYTIC - Being naturally adapted to life and growth under limited water supply by means of specialized mechanisms that limit transpiration and store water.

Section 1 Introduction



The proposed Base Realignment and Closure (BRAC) action will involve moving the Chemical and Military Police schools from Fort McClellan Alabama to Fort Leonard Wood, Missouri. The Environmental Impact Statement (HBA 1996), addresses impacts of this action on the human environment. A major component of the BRAC action involves introduction of obscurant and simulant training to the Fort Leonard Wood environment. Military uses for obscurants (smoke) include screening, deception, and identification of equipment, facilities, and troops (Shinn et al. 1987). Training simulants are used by the military to instruct soldiers in recognition of dangerous, hazardous or toxic chemicals used by enemy forces in chemical and biological warfare.

Two federally endangered species, the Indiana bat (*Myotis sodalis*) and the gray bat (*Myotis grisescens*), and one threatened species, the bald eagle (*Haliaeetus leucocephalus*) occur on Fort Leonard Wood. We performed this Ecological Risk Assessment (ERA) to comply with the Endangered Species Act, and in support of the BRAC Environmental Impact Statement (EIS). This report is an appendix to the Biological Assessment (BA) for Relocation of U.S. Army Chemical School and U.S. Army Military Police School to Fort Leonard Wood, Missouri. The ERA focuses on potential contaminants generated by Chemical and Military Police School training. Risks to endangered and threatened species estimated herein were based on either modeled or estimated exposure concentrations and literature-based toxicity values. Risks were used to determine direct effects to the species of concern. Indirect effects

were addressed qualitatively. We assessed effects to adults, juveniles, and other life stages of the Indiana bat, gray bat, and bald eagle. We evaluated:

- fog oil and terephthalic acid (obscurants),
- Biological Integration Detection Systems (BIDS) simulants,
- FOX Training simulants, including Persistent Chemical Agent Simulants (PCAS),
- non-specific simulants (Polyethylene glycol and titanium dioxide).

Fog oil has had several designations in its history which may lead to confusion. There are two types of fog oil, "old" fog oil and "new" fog oil. Fog oil also has letter designations used by the military for purchasing or issuing requests for production from manufacturers. Types A and B are "old" fog oil (also referred to as SGF 1) that were manufactured under specifications A and B before 1986. "New" fog oil, designated as type D, is also referred to as SGF 2 fog oil (Standard Grade Fuel 2). It is the primary material used by the military to produce smoke at Fort McClellan and other installations. Fog oil designated as D is currently used at Fort McClellan, Alabama. Fog oil type D or E will be used at Fort Leonard Wood. Fog oil types C, D, and E are chemically and structurally the same compounds. Differences are based in the specifications given to manufacturers.

Fog oil smoke is produced by passing fog oil into a heated air stream in a generator which expels the vaporized oil into the atmosphere. When the heated oil contacts the cooler air, it condenses into a dense fog or smoke. It is important to note that the oil is aerosolized, and not combusted or burned as the name "smoke" implies.

Terephthalic acid (TPA) will replace hexachloroethane (HC) smoke by fiscal year 1999. HC is being replaced by TPA because HC is a human carcinogen; human deaths have been associated with over-exposure to HC smoke. TPA is a safer smoke because it is noncarcinogenic. The combustion products of HC (zinc chloride, chlorinated organics, and phosgene) are more toxic than those of TPA (Muse et al. 1995). TPA is used in floating or ground smoke pots and grenades. TPA is ignited and burned to produce smoke. It is used alone or to fill in incomplete fog oil screens.

We also assessed BIDS (Biological Integrated Detection System) and FOX Training simulants. BIDS, mounted on a High Mobility Multipurpose Wheeled Vehicle (HMMWV) or

trailer, is an air sampling and detection system. Students are trained in detection and identification of biological weapons. FOX training activities include instruction on deployment and operation of the FOX vehicle and chemical detection system using simulated chemical agents. The FOX is a self-contained, amphibious vehicle with a mounted air sampling and detection system.

Non-specific simulants to be used at Fort Leonard Wood include polyethylene glycol (PEG 200) and titanium dioxide. PEG 200 is used by the military to simulate chemical warfare agents. Soldiers are exposed to an aerosol of PEG 200 and are required to decontaminate themselves and their equipment. Titanium dioxide is the major component of M82 grenades, used to simulate brass grenades. Both titanium dioxide and brass grenades produce smoke which obscures troops and equipment from infrared detection.

The objective of any ERA is to identify available chemical, toxicological, and ecological information and apply this information to approximate the probability of undesirable ecological effects (Wentsel et al 1994). We incorporate studies conducted for Fort Leonard Wood's Ongoing Mission Biological Assessment (3D/Environmental 1996b).

We define effects using measurement and assessment endpoints. We selected the measurement endpoints of toxicity tests, hazard quotients (HQ), and exposure point concentrations. We established a Hazard Quotient for each receptor for inhalation, ingestion, and dermal absorption exposure pathways. When the Hazard Quotient (HQ = TRV/exposure concentration) exceeds 1.0, we predict an adverse effect. Acute HQs describe the risk of a single exposure. Chronic HQs define the risk of exposure over the organism's lifespan.

Measurement endpoints included in this ERA address effects to individuals. Information is provided to allow for estimation of the number of individuals potentially affected by the BRAC action. No data is available regarding population measurement endpoints for receptors/stressors in this ERA. Fort Leonard Wood will monitor bald eagle, Indiana bat, and gray bat populations on the installation following implementation of the BRAC action.

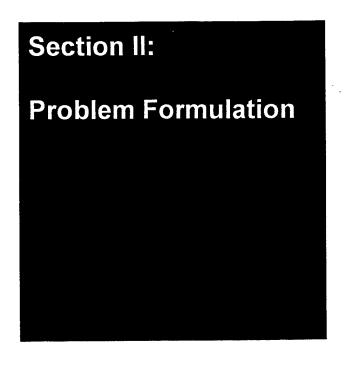
We considered exposure to toxic concentrations of any stressor to be an effect (risk). Toxicological effects identified for each stressor are converted to toxicological values or doses (i.e. NOAEL = No Observable Adverse Effects Level) not expected to result in adverse health effects. Uncertainty factors (UF) account for anatomical, physiological, or morphological

differences between species for which the dose was calculated and the assessment endpoint. Toxicity Reference Values (TRV) were developed by applying uncertainty factors to the doses (TRV = NOAEL/Uncertainty Factors) following Department of Army guidelines (Wentsel et al 1994) and procedures outlined in Calabrese and Baldwin (1993). For fog oil, BIDS simulants, FOX Training simulants, and non-specific simulants, we determined acute and chronic toxicity from data available in the literature. For TPA, a computer model was used to determine acute and chronic toxicity (3D/Environmental 1996b).

We conducted a study at Fort McClellan to assess the dispersion and persistence of fog oil in the environment (3D/Environmental 1996a). A summary of this study and the BRAC EIS Preliminary Risk Evaluation Report, conducted on new fog oil to aid in determination of risks to the human population, is included in this document. We established 3 exposure sites and one reference site where we collected tissue and media samples. The samples were analyzed for hydrocarbons identified in fog oil. Samples were taken from fog oil generators to determine if the parent fog oil undergoes transformation when it passes through the generator. Interpretation of this data is incorporated into the ERA. None of the media samples (soil, surface water, or sediment) or tissue (tree bark, leaves, fish, insect, or bat) samples from exposure sites showed significant differences in concentrations of fog oil hydrocarbons when compared to the reference site values. Based on the Fort McClellan study, fog oil does not bioaccumulate, bioconcentrate, or remain in the environment for any extended period of time. We do not anticipate environmental accumulation of fog oil at Fort Leonard Wood. Analysis of fog oil smoke from M56 and M157 generators showed little if any aromatic compounds. This indicates that parent fog oil essentially remains unchanged after it is heated and vaporized in the generators.

We modeled dispersion and deposition of fog oil, TPA, and titanium dioxide. Concentrations derived from the models are used as exposure concentrations. To assess the potential for exposure, we investigated Indiana bat hibernacula (Davis No. 2 Cave, Joy Cave, Wolf Den Cave, and Brooks Cave), and gray bat caves (Freeman and Saltpeter No. 3), Indiana bat and gray bat foraging areas, potential Indiana bat maternity habitat, bald eagle wintering locations, and bald eagle nest locations as exposure points. We compared exposure points with estimated stressor concentrations and determined if a complete exposure pathway existed. If the pathway was complete, we characterized the risk associated with this pathway. Stressor behavior within caves was characterized by measuring air flow and atmospheric conditions inside, immediately outside, and at one bat roost location for each cave.

Section 2 Problem Formulation



2.1 OBJECTIVES

This Ecological Risk Assessment (ERA) estimates the effects of proposed fog oil, terephthalic acid (TPA), Biological Integration Detection Systems (BIDS) simulants, FOX Training simulants, and non-specific simulants (polyethylene glycol and titanium dioxide) to three species. Toxicological effects from proposed BRAC actions were evaluated to determine risks for two federally endangered species of bats, Indiana bat (*Myotis sodalis*) and gray bat (*Myotis grisescens*) and a threatened species, bald eagle (*Haliaeetus leucocephalus*).

2.2 ASSESSMENT ENDPOINTS

Assessment endpoints are ecological values to be protected. Ecological values generally have either societal or economical significance, such as the Alaskan salmon fisheries. Alaskan salmon are a valuable natural resource and provide income to commercial fisherman. We selected the quantification of potential toxicological risks from chemical stressors to Indiana bats, gray bats, and bald eagles as assessment endpoints.

2.3 MEASUREMENT ENDPOINTS

Measurement endpoints are discrete values that can be assigned numerical values. Measurement endpoints selected here include: acute and chronic toxicity tests, NOAEL (No Observable Adverse Effect Level), LOAEL (Lowest Observable Effect Level), and LD₅₀ (Lethal

Dose to 50% of the test population). We determined appropriate toxicological values and compared these to modeled exposure point concentrations (for acute HQs) and calculated intakes (for chronic HQs).

Measurement endpoints selected for this study do not address how receptor populations will be affected. The measurement endpoints we used show effects that are expected for individuals, such as kidney disease or mortality. We provide information about population densities that can be used to estimate the number of individuals affected. Population characteristics are generally inferred from characteristics of individuals (Suter et al. While population effects can not be predicted from toxicity tests alone, some 1993). conclusions can be made if the number of individuals affected is known. We can estimate the number of individuals that will develop kidney disease. We do not have measurement tools to describe effects to the population if for example, 6 individuals develop kidney disease. Knowing the number of individuals affected will not describe how the stressor will impact a population, or the persistence of the population. Measurement endpoints developed for chemical stressors analyzed in this ERA have not been established. Little information is available to assess toxicity of the stressors to receptors of concern. No data exists that can be used to establish a relationship between individual mortality or illness to population effects for the stressors in this ERA.

Because available data is insufficient to develop population measurement endpoints for the receptors of concern, Fort Leonard Wood will monitor Indiana bat, gray bat, and bald eagle populations. Management practices have shown populations of long-lived vertebrates such as large mammals and predatory birds are more sensitive to mortality imposed on adults than are short-lived, highly fecund organisms such as quail or rabbits. Indiana bats, gray bats, and bald eagles have relatively long lifespans and low fecundity rates. Most individuals in receptor populations are adults. Monitoring of the populations will allow the installation to accurately determine if the population dynamics are changing. Further investigations will be required to assess if detected changes in the dynamics or structure of the populations are the result of the BRAC action or other cause.

2.4 CONCEPTUAL SITE MODEL DEVELOPMENT

Figure 1 illustrates the relationship of stressors, receptors, and exposure pathways in this ERA. This conceptual site model depicts the three receptors as adults. We assessed effects by estimating how much stressor the receptor would intake and then comparing the intake concentration to concentrations expected to result in an effect. We assessed effects to adults and other life cycle stages. In addition to sensitive life stages, receptors may be more vulnerable to stressor effects during activities such as hibernating or foraging.

Risks were estimated using the Hazard Quotient (HQ) approach. We considered HQ values greater than 1 an effect. We calculated an acute (single exposure) and a chronic (lifetime exposure) HQ for each receptor and receptor life cycle stage for each stressor. The HQ provides a point estimate of risk for the exposure pathway, receptor/receptor activity, and stressor. Because of the complexity of the BRAC action, lack of accurate predictions of exact training locations, dates, and schedules, and the number of chemicals assessed in this ERA, it is impossible to perform any type of probabilistic risk estimate. HQs are commonly used in human health risk assessments for non-carcinogenic risks as well as Ecological Risk Assessments, and are an acceptable technique to estimate risk.

Receptors may be exposed to stressors through inhalation, ingestion, and dermal absorption pathways. These pathways are considered direct. Direct pathways are those where the receptor directly contacts the stressor. Effects from exposure to stressors through direct pathways are considered direct effects. We assessed direct effects quantitatively by calculating an HQ for each direct pathway. Indirect effects are those that are removed in time or space from the receptor. We did not quantitatively evaluate indirect effects such as reduction in prey by determining an HQ for the prey population. Indirect effects are addressed qualitatively in appropriate sections in this document.

HQs were calculated at exposure locations at various distances from chemical sources. This allows estimation of the number of receptors affected by each stressor. This approach is appropriate because we do not know exactly where receptors and stressor source points will be. We also assessed effects to receptors at stationary exposure locations such as a hibernacula.

We assessed effects from each stressor in this ERA to receptors by performing a screening level risk assessment. This screening level ERA was conducted by exposing receptors to the maximum concentrations (i.e. the total amount of the chemical to be released or used) for the exposure pathway most likely to reach the receptor. For example, if the stressor was released as an aerosol, we evaluated effects of the receptor inhaling the stressor. We adjusted the intake to reflect specific metabolic and physiological characteristics of each receptor. We considered the screening level risk assessment as worst case because we assumed any stressor contacted by the receptor would be inhaled, ingested, or absorbed. It is reasonable to assume if the worst possible exposure scenario for a particular stressor did not produce an HQ >1 (effect), lessor exposures would also not affect the receptor.

Fog oil released from M157 and M56 smoke generators
Terephthalic acid released from smokepots and grenades
Chemical simulants released from various mechanisms

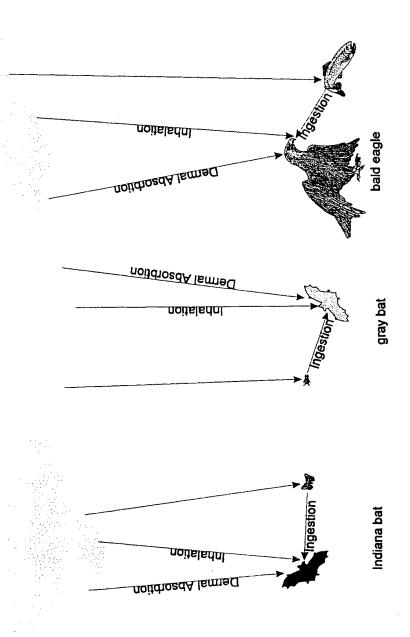
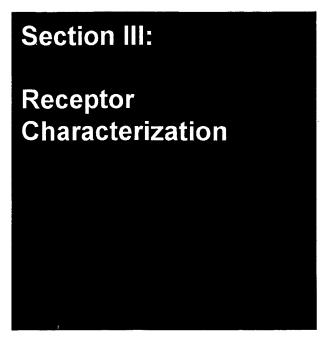


FIGURE 1. Primary exposure routes to the Indiana bat, gray bat, and bald eagle.

EFFECT OF SELECTED CHEMICALS ON INDIANA BATS, GRAY BATS, AND BALD EAGLES AT FORT LEONARD WOOD, MISSOUR!

Section 3 Receptor Characterization



We examined the biology of each receptor species to determine when and where each is likely to be exposed to chemical stressors. Behavior and life history data were incorporated into calculations of chronic and acute intakes. We also compiled information on the distribution and density of receptors to evaluate the number of individuals impacted by proposed actions.

3.1 INDIANA BATS

3.1.1 Status and Range

Indiana bats (*Myotis sodalis*) were listed as endangered on March 11 1967 by the U.S. Department of the Interior, Fish and Wildlife Service (FWS). Legal protection is provided by the Endangered Species Act of 1973 (Public Law 93-205). A recovery plan for Indiana bats was published in 1983 by a FWS-sponsored Recovery Team (FWS 1983a). Briefly, the objectives of this plan are to:

- protect hibernacula
- maintain, protect, and restore summer nursery habitat
- monitor population trends through winter censusing
- educate the public
- continue research

Maintenance, protection, and restoration of summer habitat (including nursery roost sites and foraging habitat) are now recovery priorities.

Barbour and Davis (1969) describe the range of *M. sodalis* as the eastern United States, from Oklahoma, Iowa, and Wisconsin, east to Vermont, and south to northwestern Florida (Figure 2). This range includes both summer and winter habitat. The winter range is associated with regions of well developed limestone caverns. Major populations of Indiana bats hibernate in Indiana, Kentucky, and Missouri. Smaller populations are known from Alabama, Arkansas, Georgia, Illinois, Maryland, Mississippi, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Tennessee, Virginia, and West Virginia. Approximately 85% of the population hibernates in only 7 caves, and nearly 50% may hibernate in only 2 caves (FWS 1983a).

Across the range of the species, the Indiana bat population (as recorded from counts in hibernacula) has declined since the late 1970's. Declines have been most dramatic in Missouri, where the highest statewide population (353,000) was recorded by the Missouri Department of Conservation (MDC) in 1979. The 1991 Missouri population was approximately 54% of the recorded high (MDC 1995).

The Indiana bat is found statewide in Missouri (Figure 2). The state supports nearly 50% of all Indiana bats known to exist. The species has been captured during summer in 17 counties in Missouri, and probably raise young throughout the region. Twenty-nine caves, mostly in the Ozarks, are known to have contained hibernating colonies of at least 100 Indiana bats at some time in the past (Myers 1964, LaVal and LaVal 1980, Clawson 1987, MDC 1992).

The summer range of Indiana bats is more extensive than the winter range. In late spring, Indiana bat emerge from hibernacula and migrate to summering areas. Nursery colonies are formed under loose bark of trees or within tree cavities. Males are not present in nursery colonies, but roost individually under loose bark of trees. Males may also remain in or near hibernacula during summer months. Summer habitat includes forested upland and riparian sites.

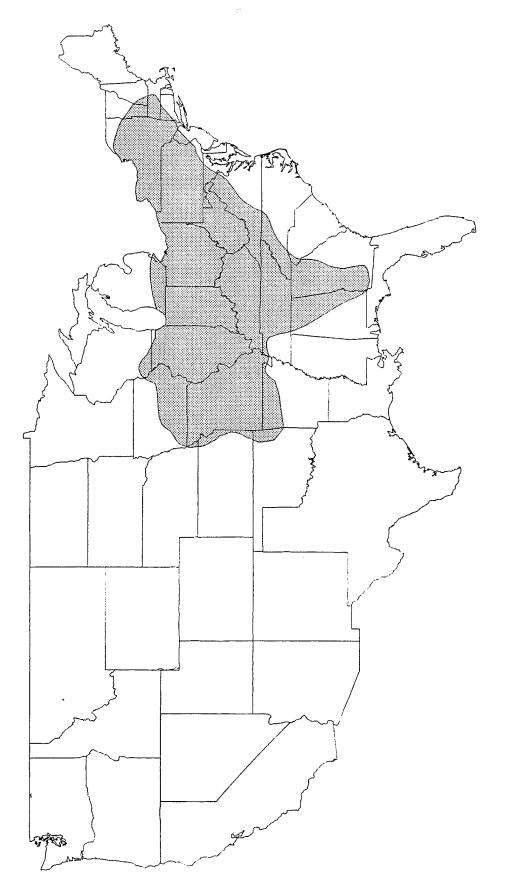


FIGURE 2. Range of Indiana bats in the United States (FWS 1983a).

3.1.2 Physical Characteristics

The Indiana bat is similar to other *Myotis*, but can be identified by a combination of physical characteristics including fur color, keeled calcar, and wing membrane attachment. Mean physical characteristics (Table 1) were used to determine surface area, food ingestion rate, and inhalation rate.

3.1.3 Life History

Indiana bats leave winter hibernating sites (hibernacula) over a two month period. This period of post hibernation activity prior to migration is called staging. Cope and Humphrey (1977) described changes in Indiana bat sex ratios during spring staging. Most Indiana bats staging in mid-April were female, while most males were still hibernating. The proportion of females detected in surveys of staging bats decreased through April as females migrated, and by early May, no females remained at the hibernaculum.

Peak departure for males occurs in early May. Some males remain near hibernacula throughout the summer. Whether or not male Indiana bats migrate, most are solitary during summer. Males roost in both upland and riparian areas and use many different roosts within a few days.

Female Indiana bats may migrate up to several hundred miles to establish maternity colonies. Females are pregnant when they arrive at summering areas. Maternity colonies are formed under exfoliating bark of dead trees, or living trees such as shagbark hickory (Carya

TABLE 1. Mean physical characteristics of Indiana bats and calculated intake rates.

Characteristic	Mean
Body weight	8 g
Total body length	83 mm
Forearm length	38 mm
Wingspread	254 mm
Surface area	0.022 m ²
Food ingestion rate	0.0025 kg/day
Inhalation rate	0.00034 m³/day

ovata) in upland or riparian forests. A single maternity colony may consist of over 100 adult females (Gardner et al. 1991). Maternity colonies are found in a variety of other tree species, including slippery elm (Ulmus rubra), American elm (U. americana), cottonwood (Populus deltoides), northern red oak (Quercus rubra), post oak (Q. stellata), white oak (Q. alba), shingle oak (Q. imbricaria), sassafras (Sassafras albidum), sugar maple (Acer saccharum), silver maple (A. saccharinum), green ash (Fraxinus pennsylvanica), and bitternut hickory (C. cordiformis).

Parturition typically occurs between late June and early July. Lactating females have been caught between June 11 and July 6 in Missouri, from June 26 to July 22 in Iowa, and from June 11 through July 29 in Indiana (Brack 1983, Clark et al. 1987, Humphrey et al. 1977, LaVal and LaVal 1980). Juveniles begin to fly between early July and early August.

Reproductive phenology is likely dependent upon seasonal temperatures and the thermal characters of roosts (Brack 1983, Humphrey et al. 1977). Like many other bats, Indiana bats are thermal conformists (Henshaw 1965), with prenatal, neonatal, and juvenile development heavily dependent upon temperature (Racey 1982, Tuttle 1975).

Autumn migration for Indiana bats begins in August. Swarming occurs when bats arrive at hibernacula. During swarming, many bats fly in and out of cave entrances (often hibernacula) from dusk to dawn. Caves may or may not be used for roosting during the day. Swarming is an important component in the life history of Indiana bats, as most mating occurs during this time (Hall 1962). Males arrive at hibernacula in August. Females begin arriving later and by September, numbers of swarming males and females are almost equal. By late September, many females have begun hibernation, and most swarming individuals are male. Their activities continue until mid-October or later, in an apparent effort to breed late arriving females (Cope and Humphrey 1977). Swarming chronology is thought to be dependent upon weather conditions including temperature and precipitation. Following swarming, Indiana bats hibernate in caves through winter.

Indiana bats hibernate from mid-November to mid-April in caves or mines with stable temperatures below 10°C, preferably from 4 - 8°C (FWS 1983a). Hibernating Indiana bats usually form dense (up to 300 individuals/square foot), clusters of thousands of individuals on

cave ceilings. These clusters include both males and females. Smaller clusters and individual hibernating Indiana bats are also common (Mumford and Whitaker 1982).

Hibernation facilitates survival during winter when prey are unavailable. However, hibernation requires sufficient fat storage to support metabolic processes until spring. Events that interrupt hibernation and increase metabolic rates pose substantial risks to hibernating bats.

3.1.4 Foraging Behavior

Indiana bats forage in upland and floodplain forests (Brack 1983, Humphrey et al. 1977, LaVal et al. 1977, LaVal and LaVal 1980, Gardner et al. 1991). Foraging activities of Indiana bats are generally concentrated from 6 to 90 feet (2 to 30 m) above the ground near the foliage of trees (Humphrey et al. 1977, Brack 1983). Indiana bats use stream corridors and forest openings as flight corridors from roosts to foraging areas.

Indiana bats may travel substantial distances from summer roosts to foraging areas. Gardner et al. (1991) found the maximum distance an Indiana bat traveled from a summer roost tree to a foraging area was 4 km. LaVal and LaVal (1980) observed male Indiana bats flying at least 5 km from summer cave roost sites to foraging areas. During the fall swarming period Indiana bats were observed foraging up to 2 km from their roost caves in eastern Missouri (LaVal et al. 1977). 3D/Environmental (1996b) provides a comprehensive literature review of Indiana bat foraging behavior and summer habitat.

3.1.5 Prey Selection

We reviewed prey selection by Indiana bats (3D/Environmental 1996b). Indiana bats consume a variety of insect Orders (Table 2) with moths and beetles dominant components of their diet.

TABLE 2. Orders of insects eaten by Indiana bats.

Order	Common Name	Life Stages			
Lepidoptera	Moths	Terrestrial			
Diptera	Flies	Terrestrial & Aquatic			
Coleoptera	Beetles	Terrestrial & Aquatic			
Trichoptera	Caddisflies	Aquatic			
Ephemeroptera	Mayflies	Aquatic			
Homoptera	Plant hoppers	Terrestrial			
Plecoptera	Stoneflies	Aquatic			
Neuroptera	Net-veined insects	Terrestrial			
Hemiptera	Bugs	Terrestrial			
Hymenoptera	Wasps	Terrestrial			

3.2 GRAY BATS

3.2.1 Status and Range

Gray bats (*Myotis grisescens*) were listed as endangered on April 28, 1976 by the U.S. Department of the Interior, Fish and Wildlife Service (FWS). A recovery plan was published in 1982. Objectives of this plan are to:

- acquire and protect hibernacula and maternity caves,
- control habitat destruction,
- · educate the public,
- continue research.

The gray bat occupies a limited geographic range in limestone karst areas of central and southeastern United States (Figure 3). Most occurrences are known from Alabama, Arkansas, Kentucky, Missouri, Tennessee, Florida, Georgia, Kansas, Indiana, Illinois, Oklahoma, Mississippi, Virginia, and North Carolina (Barbour and Davis 1969, FWS 1982).

Missouri contains approximately 20% of all gray bats known to exist. Because gray bats roost in caves year-round, its distribution in Missouri is closely tied to the availability of suitable roost caves. In Missouri, suitable caves are found primarily throughout the Ozark uplift, but some gray bats may be found northeast and west of the Ozarks. Currently, 33 - 36 maternity colonies are active, although nearly twice that number may have existed in the past (Myers 1964, LaVal and LaVal 1980, Clawson 1986, MDC 1992).

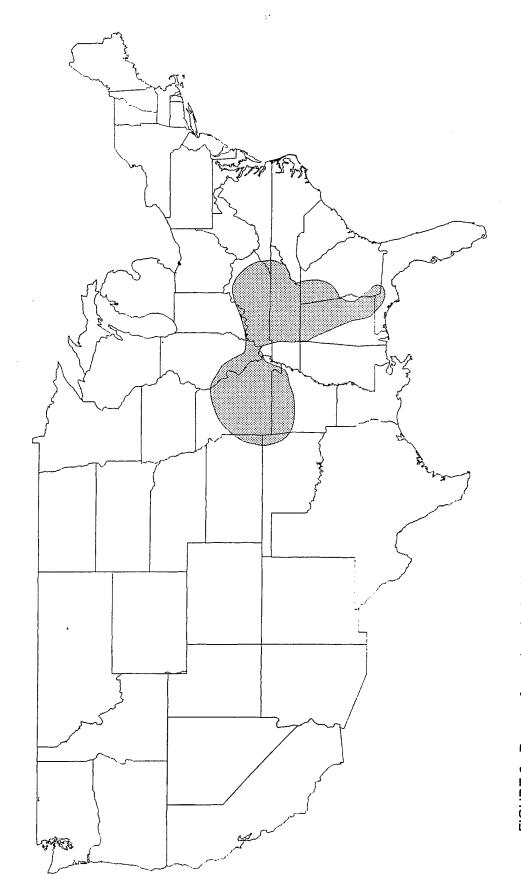


FIGURE 3. Range of gray bats in the United States (FWS 1982).

3.2.2 Physical Characteristics

The gray bat is similar to other *Myotis*, but can be identified by a combination of physical characteristics including large body size, pelage color, unkeeled calcar, wing membrane attachment at the ankle, and notched claws. Mean physical characteristics (Table 3) were used to determine surface area, food ingestion rate, and inhalation rate.

3.2.3 Life History

Unlike many other species of North American *Myotis*, gray bats inhabit caves in summer and winter. Gray bats may be more restricted to cave habitats than any other U.S. mammal (Tuttle 1979). Most gray bats migrate seasonally between hibernacula and maternity caves. Gray bats have been reported to migrate up to 326 miles (Tuttle 1976). Migration allows gray bats to utilize caves with optimal conditions for hibernating and raising young. Hibernacula are typically structured such that cold air enters in winter. Compared to Indiana bats, gray bats tend to hibernate in slightly warmer (7 - 10°C) portions of caves.

Like Indiana bats, gray bats exhibit swarming and staging behavior. Mating occurs when gray bats arrive at hibernacula in autumn. Females begin hibernation between early September and early October. Males remain active for several weeks following mating to restore fat reserves. Most juveniles enter hibernation by early November. Gray bats hibernate in large, loose clusters that may have more than a single layer (Barbour and Davis 1969).

TABLE 3. Mean physical characteristics of gray bats and calculated intake rates.

Characteristic	Mean
Body weight	10.5 g
Total body length	87 mm
Forearm length	43 mm
Wingspread	288 mm
Surface area	0.026 m ²
Food ingestion rate	0.0025 kg/day
Inhalation rate	0.0025 kg/day 0.00034 m³/day

Female gray bats store sperm throughout the winter and become pregnant soon after emergence from hibernation (Guthrie and Jeffers 1938). In late March or early April, females begin migration, followed by juveniles and males between mid-April and mid-May. Migration is a significant source of mortality for gray bats, especially juveniles (Tuttle and Stevenson 1977). When they first arrive at summer areas, both males and females use the same transient caves. By mid-May, pregnant females move from transient caves to maternity caves (LaVal and LaVal 1980). Maternity caves are typically within 1 km a river or lake, and often have a stream running through them (Tuttle 1976). Most foraging occurs within 11 km of roosts (LaVal et al. 1977).

Females give birth to a single young in late May or early June. Once young are born, females leave their young in the cave while they forage (Barbour and Davis 1969). Most males and nonreproductive females utilize non-maternity caves during May - July. Lactation typically ends by late July and most young are volant within 20 - 25 days of birth. By late July, most females and juveniles leave maternity caves (LaVal and LaVal 1980). Maternity caves are often used as transient caves after this time.

During late July and August, gray bats of mixed ages and sexes are found in many caves throughout the summering area; individuals frequently move among caves (LaVal and LaVal 1980). In September, females begin to congregate at transient caves and by the end of the month most have left for hibernacula (LaVal and LaVal 1980). Males remain in summering areas later than females. Most males leave the summering areas by November; however a small number of males may hibernate in summer transient caves (LaVal and LaVal 1980).

3.2.4 Foraging Behavior

Gray bats forage predominantly over waterways, including rivers and lakes. Individuals are loyal to their colony home range, but may utilize several caves within the home range. Newly volant young often forage in forests surrounding the maternity cave.

A variety of stream sizes, as well as reservoirs, have been reported as foraging areas for gray bats (Clawson 1984, LaVal and LaVal 1980, LaVal et al. 1977). Larger areas of streams seemed to be preferred although even the smallest of perennial streams were used (LaVal et al. 1977).

Gray bats sometimes fly great distances to forage. In eastern Missouri, gray bats were captured foraging a mean distance of 11.1 km from the cave of banding (LaVal et al. 1977). Bats netted over streams were recaptured at caves a mean distance of 12.6 km from the original capture site (LaVal et al. 1977). LaVal and LaVal (1980) reported a maximum upstream dispersal distance of 20.8 km from a cave. They also reported gray bats flying cross country as far as 24.8 km from a cave to a lake. Thomas and Best (in press) report a gray bat traveling 75 km from one cave to another.

Once a gray bat reaches its foraging area, it may remain within a limited stretch of stream or section of a lake for the remainder of the evening. Along a stream in Missouri, LaVal et al. (1977) noted individuals foraging in an area less than 1.0 km in length.

3.2.5 Prey Selection

Gray bats consume insects from both aquatic and terrestrial habitats. A review of gray bat diet studies is provided in Exhibit B, Appendix II of the Biological Assessment of the Master Plan and Ongoing Mission (3D/Environmental 1996b). Reproductive females appear to consume predominantly aquatic insects (Brack et al. 1994, Clawson 1984, LaVal and LaVal 1980), while juveniles foraging in terrestrial habitats consumed greater proportions of terrestrial insects. When adults forage in terrestrial habitats, moths and beetles appear to be important food sources.

3.3 BALD EAGLES

3.3.1 Status and Range

The bald eagle (Haliaeetus leucocephalus) was listed as endangered in 1978 by the U.S. Fish and Wildlife Service. Legal protection is provided by the Endangered Species Act of 1973 (Public Law 93-205). Recovery plans were developed by the FWS for northeastern and southeastern regions. Recovery tasks fall into four general categories:

- determine current population and habitat status
- determine minimum population and habitat needed to achieve recovery
- protect, enhance, and increase bald eagle populations and habitats
- establish and implement a coordination system for information and communication.

In 1980, only 1250 nesting pairs of bald eagles were known. Loss of habitat, shooting, trapping, toxic effects of organochlorine insecticides (Dieldrin, Endrin, DDT), and lead shot poisoning have contributed to the decline of the species. In recent years, bald eagle populations have been progressing toward species recovery. On July 12, 1995 the FWS changed the status of the bald eagle from endangered to threatened in the lower 48 states (50 CFR 17, Vol. 60).

Bald eagles are the only species of eagle with a distribution restricted to the North American continent (Grossman and Hamlet 1964). The range of bald eagles extends from the Florida coast northward to Alaska (Figure 4). Although the historic and current range of bald eagles in the United States are essentially the same (Snow 1973), current populations are much smaller.

There were 19 (11 established, 8 newly productive) successful bald eagle nests in Missouri in 1995, fledging 38 young (Wilson pers. comm. 1996). One of the 8 newly productive nests was located in Pulaski County. An additional 5 nests were active but not productive. Bald eagle production has shown a dramatic increase since 1984 when there were no known productive nests in the state. A total of 2368 bald eagles were counted during the statewide 1995 mid-winter bald eagle survey.

3.3.2 Physical Characteristics

The bald eagle is a large bird of prey. Adults, with characteristic white head and tail plumage, are easily identified. Immature eagles up to 5 years of age have a mottled brown coloration and often are confused with golden eagles (Aquila chrysaetos). Mean physical characteristics (Table 4) were used to determine surface area, food ingestion rate, and inhalation rate.

3.3.3 Life History

Wintering bald eagles migrate in response to adverse weather conditions and limited food availability. Winter habitats typically are near a readily available food resource. Bald eagles reach maximum densities in areas of minimal human activity and are almost never found in areas of heavy human activity (Peterson 1986).

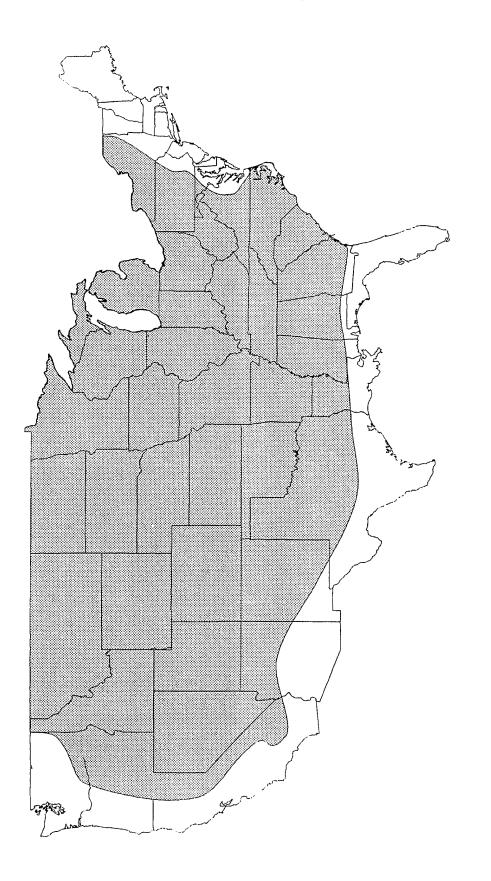


FIGURE 4. Winter range of bald eagles in the United States (ODNR 1982).

TABLE 4. Mean physical characteristics of bald eagles.

Characteristic	Mean
Body weight	4500g
Total body length	86 cm
Wingspread	239 cm
Surface area	0.275 m ²
Food ingestion rate	0.292 kg/day
Inhalation rate	1.31 m³/day

Eagles roost at night, communal or singly, in areas sheltered from extreme weather and human disturbance. Typical night roosts are in mature trees with heavy limbs and an open branching pattern. The roosts may be miles from foraging areas or feeding perches frequented during the day (Green 1985). Several authors described characteristics of preferred roost sites (Lish and Lewis 1975, Steenhof et al. 1980, Grubb et al. 1989). Mature trees with large open crowns and stout, horizontal perching limbs are preferred for roosting in general (Anthony et al. 1982, Stalmaster 1980). Roost trees are of various species, but usually are large and sheltered from prevailing winds. During migration and in winter, conifers often are used for communal roosting both during the day and at night, perhaps to minimize heat loss (Stalmaster 1980, Anthony et al. 1982). Grubb et al. (1989) observed bald eagles changing roost sites every 3 to 4 nights. Preferred roosts may become "traditional" communal roosts that are used by more than one eagle for many years. Edwards (1969) observed birds flying several miles after foraging to return to communal roosts. When human disturbance of a night roost occurs, birds may abandon the location (Steenhof 1976).

Bald eagles reach maturity at 3 - 5 years of age. Most bald eagles begin to breed in their fifth year. In Midwestern states, pair bonds are formed and breeding occurs from January to March. Bald eagles are commonly said to mate for life, but there are little supporting data. Characteristics of preferred breeding sites include proximity to large bodies of open water and an open, discontinuous canopy (Andrew and Mosher 1982, Anthony et al. 1982, Grubb 1980, Peterson 1986). In an analysis of more than 200 nests, Grubb (1980) found 55% 46 km, and 92% within 183 km of a shoreline. Eagles construct nests of sticks in the top third of trees that have overhanging branches providing cover from sun and inclement weather (Green 1985). Adults tend to use the same breeding area, and often the same nest, each year.

Nesting phenology depends largely on latitude. Egg laying ranges from November in Florida to May in Alaska. Females lay one clutch per year yielding 1 - 3 eggs. The number of eggs is reduced in years when environmental conditions are poor or when the female is in poor health. Replacement clutches may be laid (Sherrod et al. 1987). The entire breeding cycle, from initial activity at the nest through the period of fledgling dependency is about 6 months. Incubation lasts approximately 35 days, and young fledge 10 to 14 weeks after hatching. Successful pairs usually raise one to two young, occasionally three, per nesting attempt.

3.3.4 Foraging Behavior

In general, bald eagles are opportunistic feeders and take advantage of whatever food source is most plentiful and easy to scavenge or capture. Winter foraging areas and diurnal perches often are near streams, lakes, or other bodies of water. Eagles forage in upland areas in the winter when surface waters are frozen, consuming carrion including rabbits, squirrels, and dead domestic livestock such as pigs and chickens (Brown and Amadon 1968, Harper et al. 1988). Bald eagles also may steal food from other eagles as well as from hawks, osprey, gulls, and mergansers (Grubb 1971, Jorde and Lingle 1988). This may occur when there is a shortage of a primary food source (Jorde and Lingle 1988).

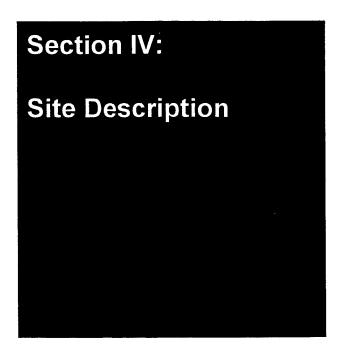
3.3.5 Prey Selection

Bald eagles eat dead or dying fish when available, but also catch live fish swimming near the surface or in shallow waters (Brown and Amadon 1968). In many areas, especially in winter, dead or injured waterfowl and shorebirds are an important food source (Todd et al. 1982).

Because bald eagles scavenge dead or dying prey, they are particularly vulnerable to environmental contaminants and pesticides. Eagles may feed on birds that died from pesticides or consume lead shot from waterfowl that were killed or disabled by hunters (Henny and Anthony 1989, Harper et al. 1988, Lingle and Krapu 1988). Bald eagles are vulnerable to biomagnification of contaminants within the food chain. Near Lake Superior (Wisconsin), over 20% of nesting pairs of bald eagles consumed herring gulls, which were found to be a significant source of PCB intake for eagles (Kozie and Anderson 1991). The gulls contained higher contaminant levels than local fish because gulls occupy a higher trophic level. A food

chain asses		exposure	pathway	analysis	for	bald	eagles	is	provided	in	the	exposure
a 3303	311101											
		-										

Section 4
Site Description



4.1 FORT LEONARD WOOD

4.1.1 Geomorphology

Pulaski County, Missouri, is within the Ozark Plateau Province covering 40,000 square miles between the Missouri, Mississippi and Arkansas rivers. The plateau is on a broad uplift called the Ozark dome, and is bordered by lowlands. The province is divided into four sections: St. Francois Mountains, Salem Plateau, Springfield Plateau, and the Boston Mountains. Pulaski County is in the Salem Plateau section. Much of Pulaski County is less than 1200 feet in elevation, except in the Boston Mountain area (Thombury 1965).

The Salem Plateau encircles the St. Francois Mountains and is widest on the northwest, west, and southwest sides (Thornbury 1965). Salem Plateau rocks originate in the Ordovician and earlier periods. In the western portion, there are limited areas of rock from Silurian, Devonian, and Mississippian periods.

The Salem Plateau is deeply dissected (100 - 500 ft) by small waterways. Deep dissections are more common in the southern part of the Plateau (Thornbury 1965). Adjacent to the St. Francois Mountains, some dissections reach Precambrian rocks. On Fort Leonard Wood, the land surface is deeply incised by waterways, particularly the Big Piney River and Roubidoux Creek. Action of water and uplift of the Ozark plateau promoted formation of many

caves on Fort Leonard Wood. The bedrock of the Roubidoux formation, a brown sandstone, is exposed in many places (Oesch and Oesch 1986). Caves on Fort Leonard Wood formed in Gasconade dolomite strata. Roubidoux sandstone forms the ceilings of many caves on Fort Leonard Wood (Oesch and Oesch 1986). More than 40 caves are known on the installation. Presence of numerous sinkholes on Fort Leonard Wood suggests undiscovered caves or solution fissures exist underground.

4.1.2 Soils

Five major soil associations occur in Pulaski County: Nolin-Huntington-Kickapoo, Clarksville-Gepp, Viration-Clarksville-Doniphan, Lebanon-Plato, and Poynor-Ocie-Gunlock (Table 5).

4.1.3 Groundwater

Groundwater in the Ozarks occurs in bedrock. Ozark underground rock is primarily carbonates and interbedded sandstones that allow vertical leakage between rock layers. Numerous fractures cause flow systems to be complex. Because water exchange is high, individual layers are not identified as aquifers (Harris 1979).

Large springs are the primary method of groundwater discharge in the Ozarks. Twelve of the 69 large springs in the United States and numerous small springs are found in the Ozarks (Thornbury 1965). Smaller springs and seeps are major water suppliers for stream and river systems. Surface water and ground water are closely related in the Ozark Plateau (Stout and Hoffman 1973). Streams and rivers lose water through their beds, charging the ground water which fuels the springs. Springs, in turn, discharge to rivers and streams.

Groundwater is available from several rock layers under the Installation. The Potosi Dolomite formation located 50 - 60 feet AMSL (800 - 1000 ft below the surface) produces the most groundwater. Two wells west of Lieber Heights family housing area tap this aquifer for average yields of 320,000 gallons per day. The U.S. Geological Survey (USGS) indicates wells drilled to mean sea level are expected to produce 300 to 400 gallons per minute. The quality of the groundwater is good (HBA 1995).

TABLE 5. Descriptions of major soil associations occurring in Pulaski County, Missouri (Wolf 1989).

Association	Location and Description
Nolin- Huntington- Kickapoo	Silty and sandy loam soils that occur on flood plains along the Big Piney River and Roubidoux Creek. Flood plains average approximately 1000 ft wide. Steep slopes and very steep uplands border flood plains. Minor soils within this association include Cedargap, Claiborne, Hartville, and Moniteau.
Clarksville- Gepp	Very cherty, cherty and stony soils on uplands, dissected slopes, narrow ridgetops, and high benches. Occurs on deep, moderately steep to very steep slopes. Somewhat excessively drained and well drained. Valleys within these areas are deep and narrow and no more than 700 ft wide. Cedargap and Claiborne are minor soils within this soil association.
Viration- Clarksville- Doniphan	Silty and very cherty soils on bluffs and dissected uplands beyond river valleys (most of Cantonment). Occurs on deep, gently sloping to steep slopes. Moderately well drained to somewhat excessively drained. Soils are dominantly silty on loess-covered ridges and very cherty soils on slopes. Minor soils include Cedargap soils.
Lebanon-Plato	Silty soils in the center of Big Piney/Roubidoux interfluve and moderately sloping uplands in northern portion the installation. Found on deep, gentle, moderate slopes. Moderately well drained and somewhat poorly drained. Gatewood, Doniphan, and Ocie soils are minor soils within this association.
Poynor-Ocie- Gunlock	Cherty and very cherty soils that make up approximately 22% of Pulaski County. Deep, gently sloping to steep, well drained and moderately well drained on uplands and terraces. Minor soils include Doniphan, Gatewood, Razort, and Viration soils.

4.1.4 Surface Water

Most of Pulaski County lies within the Gasconade River Watershed. The area covers approximately 3600 square miles and drains into the Missouri River (Stout and Hoffman 1973). Part of the county, including Fort Leonard Wood, lies within the Big Piney River watershed, which drains into the Gasconade River (Stout and Hoffman 1973).

Fort Leonard Wood is drained by Roubidoux Creek and the Big Piney River. Both are fast-moving, clear streams with large pools and gravel stream beds. These streams have cut

deeply into the landscape, causing deep valleys and high bluffs. Both streams flow northward to the Gasconade River which drains into the Missouri River.

The Big Piney River has a drainage area of 768 square miles. Fort Leonard Wood is downstream of 580 square miles of the watershed. Daily flow records, collected by the USGS River since 1921, show the average flow rate of the Big Piney River is 354 MGD (45 - 21,140 MGD; Harris 1979).

Roubidoux Creek traverses the western border of Fort Leonard Wood. The creek runs above ground at the southwestern corner of the reservation, disappears underground, and reappears as Roubidoux Spring further downstream (HBA 1995).

The only spring on the installation tested for flow rate and water quality is Stonemill Spring. The spring produces approximately 18.7 MGD and has been developed as a recreational fishing area. The USGS reports at least two other springs near the installation boundary (HBA 1995). Man-made, stationary bodies of water on the post include: Bloodland Lake; Penns Pond, a training lake at TA 250; and numerous impoundments near Normandy Training Area. Wetlands on the post are still under study (HBA 1995).

4.1.5 Climate/Atmosphere

Missouri is an inland state with a continental climate. Missouri receives cold air from Canada; warm, moist air from the Gulf of Mexico; and dry air originating in the west (NOAA 1978).

Pulaski County has a humid continental climate with hot summers and cold winters. Average temperatures range from 18°F to 46°F in winter and 64°F to 90°F in summer. Annual precipitation averages 42 in (24 - 66 in). Average annual snowfall is approximately 20 inches (Wolf 1989).

4.1.6 Natural Resources

4.1.6.1 Vegetation and Physiographic Region

Pulaski County is located within the Oak-Hickory Forest region of the Interior Highlands. Forests of the Ozark Plateau are principally different species compositions of oak, with or

without hickories. Oak-Hickory and Oak-Pine forest are dominant over most of the Salem Plateau section of the Ozark Plateau (Braun 1950).

Regionally, broad uplands or narrow upland ridges are common, while rocky barrens and limestone glades are local features. Larger streams have cut deeply valleys, cliffs, and talus slopes. A community of post oak (*Quercus stellata*) and blackjack oak (*Q. marilandica*) occurs on drier ridges with sandier soils and southern slopes. In certain areas, oak-pine communities are formed by either species of oak along with yellow pine (*Pinus echinata*). White oak (*Q. alba*) is common on northerly slopes. Other common species are hickories (*Carya* spp.) winged elm (*Ulmus alata*), and persimmon (*Diospyros virginiana*). Black oak (*Q. velutina*) enters forest communities and may replace pines during succession, leading to an oak-hickory community (Braun 1950).

Common understory species in upland oak-pine communities include dogwood (*Cornus florida*), *Vaccinium* spp., New Jersey tea (*Ceanothus americanus*) and fragrant sumac (*Rhus aromatica*). The herbaceous layer is composed mainly of oat grass (*Danthonia spicata*), St. Andrews cross (*Ascyrum hypericoides*), bird-foot violet (*Viola pedata*), mountain mint (*Pycnanthemum flexuosum*), stone-mint (*Cunila origanoides*), wild aster (*Aster patens*, *Aster linariifolius*), and legume species (Braun 1950).

In slope forests, dominant canopy trees often are white and black oaks. Red oak (*Q. rubra*) is common in mesic conditions, whereas dogwood is common in drier situations. Common understory trees and shrubs include redbud (*Cercis canadensis*), hornbeam (*Ostrya virginiana*), iron wood (*Carpinus caroliniana*), red mulberry (*Morus rubra*), serviceberry (*Amelanchier arborea*), paw-paw (*Asimina triloba*) and southern buckthorn (*Bumelia lanuginosa*). Summer flora is less varied in slope forests than in uplands. Common shrubs in the area include hydrangea (*Hydrangea arborescens*), Virginia creeper (*Parthenocissus quinquefolia*), black raspberry (*Rubus occidentalis*), green-briar (*Smilax hispida*), and spice bush (*Lindera benzoin*). The herbaceous layer generally is open and includes false Solomon's seal (*Smilacina racemosa*), bellwort (*Uvularia grandifolia*), wild geranium (*Geranium maculatum*), stonecrop (*Sedum ternatum*), passion flower (*Passiflora lutea*), wild comfrey (*Cynoglossum virginianum*), goldenrod (*Solidago caesia*) and white snakeroot (*Eupatorium rugosum*) (Braun 1950).

In mesic slope forests, red oak (*Q. rubra*) and sugar maple (*Acer saccahrum*) are dominant canopy species. They are particularly abundant in limestone forests along with other trees such as white oak, chinquapin oak (*Q. muhlenbergii*), basswood (*Tilia americana*), and bitternut hickory (*C. cordiformis*). The undergrowth on mesic slopes is dense, resembling that of the eastern mesophytic forests more than oak forests of this region. Most shrubs and herbs on mesic slopes are common and widespread species (Braun 1950).

Lowlands of the Salem Plateau, except for alluvial lands of larger rivers, support stages of succession leading to establishment of maple-hickory forests. Common species in lowlands are silver maple (*A. saccahrinum*), sycamore (*Platanus occidentalis*), black willow (*Salix nigra*), cottonwood (*Populus deltoides*), white elm (*U. americana*), river birch (*Betula nigra*), and green ash (*Fraxinus pennsylvanica*). Sweet gum is abundant and associated with white and winged elm, walnut (*Juglans* spp.), river birch (*Betula nigra*), and sycamore (Braun 1950).

Cliffs, rocky limestone slopes, and balds support xerophytic communities. Red cedar (*Juniperius virginiana*) is the dominant tree in xerophytic communities. Glades occur on southerly facing slopes and are characterized by their xerophytic flora. Glades may be treeless, although there are usually scattered red cedars, redbuds, oaks, and dogwoods. Open glades are rapidly encroached upon by pioneer forest communities (Braun 1950).

Most land on Fort Leonard Wood is forested. The oak-hickory forest association is predominant. On bottomlands, the sycamore-elm-soft maple association is common (HBA 1995). North facing slopes are usually vegetated with black, red, and white oak, while southern slopes are dominated by post oak, blackjack oak, and hickories. The shrub layer and herbaceous layer are rich with both woody and herbaceous plants (Braun 1950).

On Fort Leonard Wood, unforested land not used for military training is covered with annual grasses, herbaceous plants, patches of broom sedge (*Andropogon virginicus*), sumac (*Rhus* spp.), coralberry (*Symphoricarpos occidentalis*), persimmon, and sassafras (*Sassafras albidum*). Kentucky bluegrass (*Poa pretensis*) is also common in some areas.

4.1.6.2 Wildlife

Many species of wildlife occur on Fort Leonard Wood. See Volume III, Appendix F of Draft Environmental Impact Statement (HBA 1996) for a complete list of all species identified or known to occur on Fort Leonard Wood. Mammals known to inhabit the installation include white-tailed deer (Odocoileus virginianus), beaver (Castor canadensis), muskrat (Ondatra zibethicus), mink (Mustella vison), raccoon (Procyon lotor), opossum (Didelphus virginiana), skunk (Mephitis mephitis), red fox (Vulpes fulva), gray fox (Urocyon cinereoargenteus), gray squirrel (Sciurus carolinensis), and cottontail rabbit (Sylvilagus floridanus). Species of game birds observed on the installation include northern bobwhite (Colinus virginianus) and wild turkey (Meleagris gallapavo). Fort Leonard Wood is the temporary home for migrating birds throughout the year (HBA 1995).

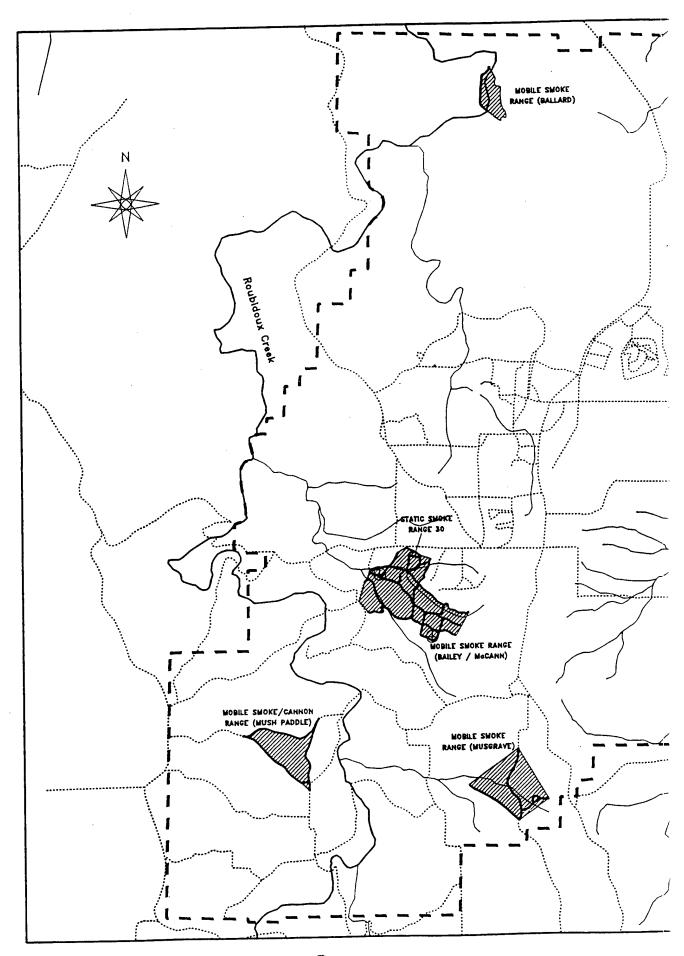
4.2 FOG OIL MOBILE AND STATIC SMOKE TRAINING AREA DESCRIPTIONS

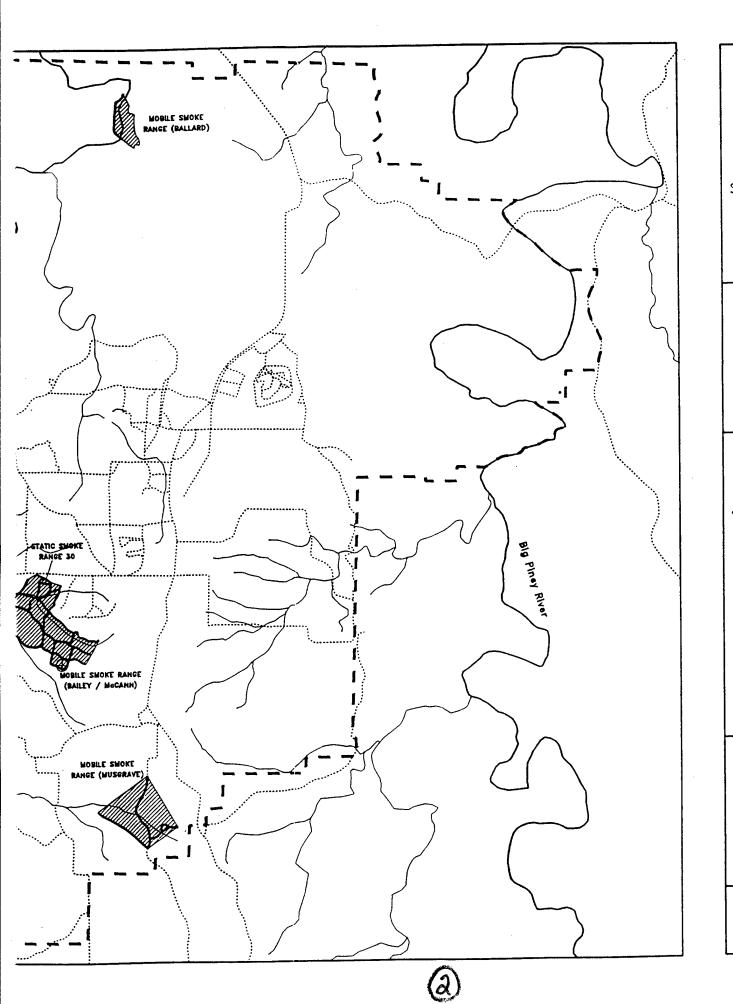
We investigated 4 mobile fog oil training areas, designated in the Fort Leonard Wood Air Permit Application - Project/Facility No. 3860-0004-015 Issued by State of Missouri Department of Natural Resources (April 1995). The four sites occur in Musgrave Hollow, Ballard Hollow, Cannon Range (Mush Paddle Hollow), and Bailey/McCann Hollow (Figure 5). Static smoke training is proposed only at Range 30F in Bailey/McCann Hollow.

4.2.1 Musgrave Hollow

Musgrave Hollow is near the southern edge of the installation, east of Cannon Range. Musgrave Hollow contains highly fragmented forest patches. Prescribed and accidental burning keep forests in most of this area in an early successional stage.

The stream in Musgrave Hollow is fed by a spring that flows most of the year. In the driest seasons, the stream averages 7.5 m wide. Upland areas are dominated by oaks averaging 20 cm dbh. Soil types in the hollow are Cedargap cherty silt loam in the riparian zone, Claiborne and Viraton silt loams on the pine plantations, and Poynor cherty silt loam on the uplands.





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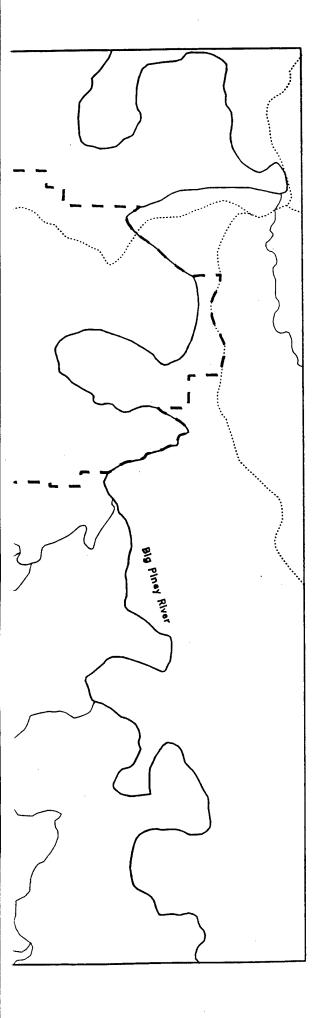
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APPENDIX IV TO BIOLOGICAL ASSESSMENT:

RELOCATION OF U.S. ARMY CHEMICAL SCHOOL AND MILITARY POLICE SCHOOL TO FORT LEONARD WOOD, MISSOURI

FIGURE 5. Proposed fog oil smoke training areas at Fort Leonard Wood, Missouri.

- Offroad Mobile Smoke Deployment
 Area
- --- Mobile Smoke Deployment Road
- ⊕ Smoke Training Tower
- Fort Leonard Wood Boundary
- ······ Road
- --- River / Stream

Kilometers

3D/ENVIRONMENTAL

4.2.2 Ballard Hollow

Ballard Hollow is near the northern border of Fort Leonard Wood, in the Roubidoux Creek valley, south of Cedar Hill Cemetery. West of Roubidoux Creek, topography in Ballard Hollow is dominated by steep, forested slopes. Unforested floodplain occurs east of Roubidoux Creek in Ballard Hollow.

Roubidoux Creek is ca. 25 m wide in Ballard Hollow and flows from south to north. The valley is dominated by sycamores averaging 35 cm dbh. Uplands west of Roubidoux Creek are dominated by oaks averaging 30 cm dbh. Some old field areas are south of the oak forest on the west side of the creek. Soil types include: Nolin silt loam in the riparian zone, Kickapoo fine sandy loam and Claiborne silt loam on slopes, and Clarksville-Gepp very cherty silt loams on uplands.

4.2.3 Cannon Range (Mush Paddle Hollow)

Mush Paddle Hollow is in the western portion of Cannon Range, in the southwest corner of Fort Leonard Wood. The stream in Cannon Range (Mush Paddle Hollow) flows seasonally. Soil types in Cannon Range (Mush Paddle Hollow) are Cedargap cherty silt loam in the riparian zone, Poynor and Clarksville-Gepp very cherty silt loams on the slopes, and Doniphan very cherty silt loam on upland areas of Cannon Range.

4.2.4 Bailey/McCann Hollows

Bailey/McCann Hollows are located southwest of Bloodland Lake and northeast of Cannon Range. Most of the area between Bailey and McCann hollows is to be used for training. Past and present training, prescribed and accidental burns, and firebreaks have cleared much of forest in this area.

Streams in Bailey/McCann hollows are ca. 6 m wide, and flow seasonally. Vegetation along the streams is uniformly small elms and maples. Stands dominated by oaks and hickories with trees averaging 20 cm dbh are scattered between the hollows. Soil types are Cedargap cherty silt loam in riparian zones, Clarksville very cherty silt loam and Gunlock silt loam on the slopes, and Ocie cherty silt loam on uplands.

4.2.5 Range 30F

Range 30F is within the Bailey Hollow area. The majority of the area is highly disturbed woodland, but there is a strip of mature forest 100 m wide along an intermittent stream. Soils types are Cedargap cherty silt loam in riparian zones, Clarksville very cherty silt loam, and Lebanon silt loam on the uplands.

4.3 TEREPHTHALIC ACID SMOKE POT AND TEREPHTHALIC ACID AND TITANIUM DIOXIDE TRAINING LOCATIONS

There are 22 grenade training locations on Fort Leonard Wood, where TPA and titanium dioxide grenades will be deployed: TA 148, 243,,238, 240N, 240S, 241, Range 33, 238B, 233, 237, 270, 271, 272, 273, Range 28, FP 6, Sapper TA, TA 126, 125, 194, 234, and grenade training road. There are 9 locations where smoke pots will be deployed on Fort Leonard Wood: Cannon Range (Mush Paddle), Bailey McCann, Mush Grave, and Ballard mobile smoke training areas, and FP 6, Range 28, Range 33, Ballard - In, and Ballard - Out.

In our assessment of effects of TPA grenades and smoke pots, we measured distances from mouths of Indiana bat hibernacula, gray bat caves, and Roubidoux Creek and Big Piney River to a central point within applicable training areas. Actual distances from caves and waterways to precise deployment sites may be less than distances displayed in Tables 26, 28, and 30.

Habitat in grenade and smoke pot training locations is variable. Most of the training locations are open field with little vegetation. Soil types and geomorphological features are described in Section 4.1.

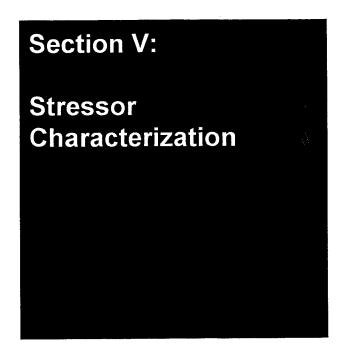
4.4 BIDS AND FOX TRAINING SIMULANTS

BIDS and FOX training simulants will be used indoors or outdoors. Interior training will occur in the General Instruction Facility and exterior training will occur on existing training ranges. General description of the habitat of Fort Leonard Wood is presented in Section 4.1.

4.5 POLYETHYLENE GLYCOL (PEG 200)

PEG 200 will be used at Hasty Decontamination sites. See HBA (1996) for further descriptions of the habitat and site features of these locations.

Section 5
Stressor Characterization



5.1 SELECTION OF CHEMICALS OF POTENTIAL CONCERN

We assessed obscurants, BIDS and FOX training simulants, and non-specific simulants for the ERA. We developed a list of COPC (Chemicals of Potential Concern) from the comprehensive list of chemicals, munitions, equipment, and materials listed in Attachment A (Table A-1). These items were provided by Fort McClellan's Military Police School and Chemical School, and represent chemicals expected to be used at Fort Leonard Wood. Fog oil and terephthalic acid were both evaluated as smoke/obscurants. We addressed effects from all identified simulants expected to be used at Fort Leonard Wood (Table 6).

5.2 CHEMICAL PROPERTIES AND DESCRIPTIONS

5.2.1 Fog Oil

Fog oil, SGF2, types D and E, are composed of alkanes, alkenes, and alkynes (hydrocarbons C_2 to C_{50}).

5.2.1.1 General Description

Fog oil is a middle distillate product of crude petroleum oil. Crude petroleum oil has different components depending on its source. There is no exact formulation or specific

TABLE 6. Chemical stressors evaluated for the ecological risk assessment.

Chemical Stressor	Training Use					
Fog Oil - (SGF2), M56 (XM), M157 = Generators	Smoke Training					
Terephthalic acid (TPA)	0 4 7 11					
TPA Grenades M83 (XM40), TA M93	Smoke Training					
TPA Smoke Pots - floating M8TA, XM8 or XH11	Smoke Training					
BIDS & FOX Simulants						
Bacillus subtillus	BIDS					
Male specific coliphage	BIDS					
Erwinia herbicola	BIDS					
Ovalbumin	BIDS					
Kaolin Dust	BIDS					
Anisole	FOX					
Benzaldehyde	FOX					
Cyclohexane	FOX					
DEM - Diethyl malonate	FOX					
Diethyl phthalate	FOX					
Dimethyl phthalate	FOX					
Ethyl phthalate	FOX					
Eucalyptol	FOX					
MES - Methyl Salicylate	FOX					
Soman (GD)	FOX (PCAS)					
Sodium carbonate						
polyethylene oxide						
hydroxyethyl cellulose						
glycerol						
diethyl malonate (DEM)	EOV (DCAS)					
Mustard Lewisite	FOX (PCAS)					
ferrous ammonium sulfate						
polyethylene oxide						
hydroxyethyl cellulose glycerol						
methyl salicylate						
CADS (Chemical Agent Disclosure Solution)	FOX (PCAS)					
2,2 Dipyridyl	101(1010)					
phenophthalein						
isopropanol						
· · · · · · · · · · · · · · · · · · ·						
Non-specific simulants						
PEG 200 (mixed butyl mercaptan)	chemical warfare					
	training					
Titanium dioxide (M82 grenades)	obscurant training					

chemical composition for petroleum products like fog oil. The first distillation volatilizes gases, naptha, gasoline, and middle distillate fractions. The remaining material ranges in molecular size from C_2 to C_{50} . A further refining of the middle distillate transforms the pale oils to white oils. The petroleum distillate the military calls fog oil is also used as a diesel engine lubricating oil (Lushbaugh et al. 1950). Industrial uses include: metal working, cutting oils, newspaper ink, agricultural pesticides, livestock spray, and medicinal uses such as laxatives.

Fog oil can be described as a mineral oil, petroleum distillate, hydrotreated heavy napthenic base oil. Chromatographic analysis of SGF 2 fog oil indicated aliphatic, alkane, and alkene hydrocarbons were present. No aromatic hydrocarbons were detected in a sample of liquid fog oil (type C or D) analyzed in August 1995 (3D/Environmental 1996a). Earlier analysis of old fog oil samples indicated 50% aliphatic and 50% aromatic compounds (Ballou 1981). Bausum and Taylor (1986) reported the following for old fog oil:

- total paraffins and aromatics often are present in equal amounts
- thousands of chemical species are present
- aliphatic compounds include normal branched alkanes, cycloparaffins, and olefins
- aromatic hydrocarbons range from one-ring compounds to those with four or more rings
- alkyl aromatic hydrocarbons may be present
- small amounts of polar organic substances (acids, esters, and alcohols) are in fog oil
- organic nitrogen and sulfur compounds and heavy metals may be present.

Fog oils and other petroleum products are used to produce white smokes. The military has used standard grade fuels (SGF 1 and SGF 2), diesel fuel, jet fuel JP4, and kerosene to produce smoke. SGF 1 has not been supplied to the military since the 1970s (Liss-Suter and Villaume 1978). SGF 2 fog oil has been used by the military since 1956, specification MIL-F-12070A or NATO Code No. F-62. A few years prior to the issue of MIL-F-12070C, fog oil was designated as "new" because the refining process was modified to reduce aromatic hydrocarbons which are potentially harmful (carcinogenic) (Driver et al. 1992). Fort McClellan uses fog oil Type D and Fort Leonard Wood will use fog oil type D or E depending on the military specifications provided to fog oil manufacturers at the time. Fog oil types C, D, and E do not and will not contain aromatic hydrocarbons. The physical and chemical properties of types C, D, and E fog oils are the same. They differ in manufacturer testing requirements. Fog oil type D must pass a mutagenicity test before it can be sold to the military. Fog oil type

E will have an added carcinogenicity test requirement. Physical properties were reported in the Military Specification Number MIL-F-12070D, Amendment 1, April 29, 1993 (Table 7).

5.2.1.2 Formation and Dispersion of Fog Oil Smoke

Fog oil was used by the military to conceal troops, beach landings, and supply lines during World War II and the Korean War. Oil burners were used to produce smoke initially, but the military now uses diesel or gasoline powered smoke generators. Smoke may be produced from mobile armored personnel carriers (mobile smoke), or from stationary locations (static smoke).

One of the first smoke generators used by the Army, and the generator used by Fort McClellan, was the M³A3, a gasoline-driven pulse jet generator. The M³A3 has been replaced by more efficient M³A4, M56, and M157A2 generators. The M³A4 generator uses gasoline (military mogas) as a fuel. The maximum fog oil consumption rate for the M³A4 generator as reported in the Technical Manual is 50 gph (U.S. Army Technical Manual, TM 3-10040-276-10).

Mobile units proposed for use at Fort Leonard Wood (M56 and M157) that produce fog oil smoke burn up to 63 gph of diesel fuel. The M56 is a turbine based multispectral smoke generator. The M157A2 is mechanized pulse jet generator. Both the M56 and M157 have a fog oil consumption rate between 60 to 80 gph.

The M56 was developed for highly mobile, large-area and visual obscuration. It is a turbine based smoke generator mounted on a M1097 High Mobility Multipurpose Wheeled Vehicle (HMMWV). The turbine engine produces exhaust gas for vaporizing fog oil to provide

TABLE 7. Physical properties of fog oil.

Property	Value
Flash point, minimum	160°C
Saybolt universal viscosity	37.78°C (min) to 43.3°C (max)
Pour point	- 40°C
Density	0.92 g/cm ³
Maximum carbon residue	0.1 %
Maximum neutralization number	0.1

visual smoke. The M56 can make smoke for 90 minutes by pumping fog oil from two 45-gallon fog oil tanks to the turbine exhaust gas. This system entered production in 1995.

The M157 produces large-area visual smoke screens. The M157 smoke generator system is mounted on a HMMWV (mobile smoke) or track vehicle (mobile smoke). It consists of two pulse jet engine smoke generators, a control panel, an air compressor and accumulator, an electric fog oil pump, and an external fuel supply. Each smoke generator on the vehicle uses a jet engine to vaporize fog oil.

Fog oil is subjected to high temperatures during smoke generation: 540°C for the M³A4 generator. The fog oil is not ignited inside the generator but some thermal decomposition and chemical interaction with exhaust gases can occur. Industrial Oils Unlimited, a military fog oil manufacturer, reported on a 1989 fog oil Material Safety Data Sheet that thermal decomposition products of fog oil are CO, CO₂, and oxides of sulfur. Volatile compounds, primarily alkanes up to C₁₁ remain in the vapor state during the life of the fog. In a study of old fog oil, Bausum and Taylor (1986) reported there may be an increase in the aromatic component of fog oil that occurs during smoke production. No aromatic hydrocarbons were detected (MDL Method Detection Limit = 5 mg/L) in post-generator fog oil samples generated by M157 and M56 generators (3D/Environmental 1996a).

The diameter of fog oil aerosol droplets ranges from 0.5 μm to 1.2 μm (Liss-Suter and Villaume 1978). Fog oil droplets tend to agglomerate, which increases the rate of settling or deposition. Liss-Suter and Villaume (1978) reported fog oil droplets remain in the air an average of one hour. Settling rate varies with meteorological conditions. Fog oil droplets may be called particulate matter, and are considered aerosols based on their size. Particle size distribution of fog oil droplets is dependent upon generation method and concentration. Higher concentrations of fog oil in the atmosphere cause faster agglomeration of droplets.

Dispersion of liquid, recondensed fog oil is dependent upon meteorological conditions, site geography, mode of generation, and land surface structure. Deposited fog oil tends to be adhesive and is unlikely to be resuspended. Deposited fog oil evaporates within 24 hours after deposition (Mike Farmer, December, 1996, pers. comm.).

5.2.1.3 Fog Oil Deposition and Evaporation

Fog oil aerosols are recondensed fog oil vapor. When fog oil is passed through a generator, it is atomized or aerosolized. Fog oil smoke is a result of the hot vaporized oil recondensing after it is released into the atmosphere. Airborne fog oil aerosols deposit onto soil, water, vegetation, and other surfaces in the dispersion pathway. Fog oil deposits downwind and generally close to the source. Fog oil deposition rates range from 50 to 1300 mg/m² at 1 km from the source (Driver et al. 1992). Worst-case estimates of fog oil deposition have been reported at <10 mg/m² at distances greater than 2 km (Driver et al. 1992). Fog oil may undergo weathering, evaporation, and emulsification, before and after deposition. Chemical processes that may transform fog oil include photo-oxidation and polymerization. In addition to physical and chemical reactions, fog oil is biodegradable.

Some fog oil particles evaporate immediately. The mass of fog oil droplets decrease with time, and the rate of decrease is a function of temperature. Driver et al. (1992) estimated the rate of evaporation for 90% of aerosol fog oil ranges from 15 days to 150 days as temperature decreases from +40°C to -40°C. These times probably exceed actual residence time of fog oil in the environment because other physical and chemical processes (weathering, photo-oxidation, etc.) simultaneously degrade fog oil. If the evaporation rate of fog oil is not used to predict surface deposition, fog oil deposition may be overestimated by 50% to 70% (Driver et al. 1992).

5.2.1.4 Physical Processes

Exposure to the environment causes weathering. The weathering process occurs more rapidly when a compound is in the vaporized state (Driver et al. 1992). Fog oil compounds do not remain in the atmosphere long enough to attribute mass loss to weathering processes.

Emulsification may occur when fog oil is deposited onto surface water. A fog oil film may form on the surface of the water and undergo emulsification, biotransformation, biodegradation, and evaporation.

5.2.1.5 Predicted Fog Oil Use

Fog oil use is proposed in 5 smoke training areas at Fort Leonard Wood: Musgrave Hollow, Ballard Hollow, Cannon Range (Mush Paddle Hollow), Bailey/McCann Hollow (mobile), and Range 30F (static) (Figure 5). Burns and McDonnell (1993) modeled dispersion of fog oil under Pasquill categories A - F from mobile smoke training areas. The data was used by the Missouri Department of Natural Resources, Division of Environmental Quality, for the Air Permit Application for static and mobile fog oil training at Fort Leonard Wood. The permit specifies daily and yearly limitations of fog oil use. Since the permit was issued, the proposed amount (both daily and yearly) of fog oil use has changed to reflect an increase in number of military personnel to be trained at Fort Leonard Wood.

We assessed risks to Indiana bats, gray bats, and bald eagles from implementation of one of the 4 training alternatives proposed in the preliminary draft Environmental Impact Statement (HBA 1996). The three action alternatives, Relocate Current Practice (RCP), Environmentally Preferred Training Method (EPTM), and Optimum Training Method Alternative (OPTM) differ in the amount of fog oil to be used in Training Activities 7.2 (static smoke), 7.3 (mobile smoke operations), and 7.4 (mobile field training). Fog oil use is not proposed in the No Action Alternative (Table 8). We analyzed effects based on the quantity specified in the for Optimum Training Method Alternative (OPTM) static and mobile fog oil training.

Our analysis assumes daily maximum use of 1200 gallons of fog oil in static and/or mobile training, with a source rate of 0.66 gallons per minute. The yearly maximum quantity varies for each static and mobile smoke training alternative. We used a maximum of 20 generators for static training and 12 generators for mobile training.

5.2.1.6 Environmental Fate of Fog Oil

3D/Environmental (1996a) conducted an environmental fate study of fog oil at Fort McClellan, Alabama. No increase of fog oil hydrocarbons were noted in soil, surface water, sediment, tree bark, leaf, insect, or bat tissue samples taken from high use (fog oil exposure sites. Fog oil is readily biodegradable and will remain in soil only a few days, depending on soil fauna present and time of year the fog oil is released. No studies have been produced that indicate new fog oil will bioaccumulate in soil or other media.

TABLE 8. Static and mobile fog oil training alternatives, associated quantities of fog oil, and proposed number of fog oil generators (Darrel Sisk, April 17, 1996 pers. comm.). Only the OPTM is assessed in this ERA.

		Training Activities	
Alternative	7.2 Static Smoke	7.3 Mobile Operations	7.4 Mobile Field Training
No Action	0 generators	0 generators	0 generators
	0 gal/yr.	0 gal/yr.	0 gal/yr.
Relocate Current	20 generators	12 generators	12 generators
Practice (RCP)	20,000 gal/yr.	41,500 gal/yr.	64,000 gal/yr.
Optimum Training	20 generators	12 generators	12 generators
Method (OPTM)	8500 gal/yr.	20,000 gal/yr.	56,000 gal/yr.
Environmentally Preferred Training Method (EPTM)	1 generator 1000 gal/yr.	12 generators 20,000 gal/yr.	12 generators 28,500 gal/yr.

Harmful quantities of fog oil are not expected to occur in the environment at Fort Leonard Wood because it is readily biodegraded by aerobic microorganisms. Large quantities of fog will not reach caves, groundwater, or other water systems via soil erosion, deposition, or storm water runoff. When fog oil enters water, it is attenuated rapidly due to its water solubility. Fog oil is also biodegraded by microorganisms and can undergo chemical degradation in aqueous environments. We do not anticipate any accumulation of fog oil or its components in the soil, groundwater, or surface water at Fort Leonard Wood. It should not cause any indirect effects to Indiana bats, gray bats, or bald eagles by reducing or affecting their prey.

5.2.2 Terephthalic Acid (TPA)

5.2.2.1 Chemical Structure

C₆H₄(COOH)₂

5.2.2.2 General Description

TPA is usually found as white crystals or powder. It is insoluble in water, ether, acetic acid and is slightly soluble in alcohol. TPA is soluble in alkalis. TPA is commonly used as a reagent for alkali in wool and as an additive to poultry feed. TPA has a relatively low toxicity (Hawley 1977).

5.2.2.3 Environmental Fate

TPA can enter the environment during the in manufacture of polyester fibers, films, and bottles. Wastewater samples from a polyester fiber industry were found to contain TPA. The origin of TPA in polluted rivers in Japan was attributed to anthropogenic sources. Most TPA in air particulate matter in a relatively unpolluted mountainous region of Japan was produced by the photochemical oxidation of anthropogenic compounds during long-range transport.

A biodegradation test with soil suspension suggests TPA may readily biodegrade in soil. TPA may biodegrade slowly in subsurface soil. The estimated K_{oc} value of 292 for undissociated TPA indicates that it would have moderate mobility in soil (HSDB 1987).

In screening tests, TPA was found to biodegrade in water, particularly when the microorganisms in aquatic media are adapted to the compound. No quantitative data are available for the rate of biodegradation of TPA in natural water. The loss of TPA from water due to photolysis, hydrolysis and oxidation by hydroxyl radicals does not appear to be important. The estimated K_{oc} of 292 suggests some undissociated TPA may be removed from water by absorption onto suspended solids and sediment (HSDB 1987). The estimated bioconcentration factor (BCF) of 19 indicates bioconcentration of TPA by aquatic organisms should not be significant. EPA (1989) suggests, bioconcentration factors > 300 are of a concern to biota.

TPA has been selected to replace the more toxic and hazardous hexachloroethane. TPA has been shown to be degraded by soil and aqueous microorganisms.

5.2.2.4 Environmental Transformation

Phthalate esters undergo primary and ultimate biodegradation in naturally occurring microbial systems which may include some form of enzymatic hydrolysis. The rate of

degradation can depend upon temperature, pH, presence of oxygen, phthalate structure, and other variables.

A strain of *Mycobacterium lacticolum* that can degrade TPA was isolated from industrial sewage containing terephthalate. In tests conducted under aerobic conditions with activated sludge as inoculum, TPA at an initial concentration of 100 mg/L was found to be biodegradable. Adaptation of microorganisms accelerates the biodegradation of TPA. At the end of 24 days of acclimation of activated sludge, 96% of TPA at an initial concentration of 1000 mg/L of COD biodegraded in 4 hours. TPA was determined to be biodegradable under other biodegradation screening test conditions. Complete loss of TPA occurred in 2 days from a soil suspension inoculum containing 20 ppm of the compound. Limited anaerobic biodegradation of TPA appeared to have occurred when industrial waste containing the compound was injected in a subsurface aquifer.

Because phthalate esters do not possess significant absorption maxima in the terrestrial sunlight region of the electromagnetic spectrum, they are unlikely to undergo direct photochemical reactions in surface waters. TPA does not contain hydrolyzable functional groups. Therefore, hydrolysis of TPA should not be important. Direct photolysis of TPA in the environment has been assessed to be unimportant (HSDB 1987). The rate constant for the vapor-phase reaction of TPA with photochemically produced hydroxyl radicals has been estimated to be 2.75×10^{-13} cu cm/molecule-sec. This rate constant corresponds to a half-life of 58 days at a daily average atmospheric hydroxyl radical concentration of $5 \times 10^{+5}$. The rate constant for the reaction of photochemically produced OH $^{-1}$ radicals with TPA in water at pH 9 has been estimated to be $3.2 \times 10^{+9}$ L/mole-sec. Based on a hydroxyl radical concentration of 3×10^{-17} mole/L in natural eutrophic waters, this reaction will not take place in water.

5.2.2.5 Environmental Transport

Bioconcentration

The bioconcentration factor (BCF) for undissociated TPA in aquatic organisms can be estimated at 19, based on $\log_{10} K_{ow}$ of 2. Therefore, bioconcentration of undissociated TPA in aquatic organisms may take place, but EPA (1989) reports BCFs greater than 300 are considered significant.

Soil Absorption/Mobility

The dissociation constants pK1 and pK2 for TPA at 25°C are 3.54 and 4.46,

respectively. In most natural waters and soils where the pH is close to neutral, TPA will exist

predominantly in the ionic form. Ionic compounds may be absorbed to soil, and suspended

solids and sediment in water by ion exchange or absorption at mineral surfaces. However, the

mechanism of absorption of undissociated TPA is expected to be similar to covalent organic

compounds. The estimated Koc value indicates that undissociated TPA will show medium

mobility in soil.

Volatilization from Water/Soil

The dissociation constants pK1 and pK2 for TPA at 25°C are 3.54 and 4.46,

In most natural waters where the pH is close to neutral, TPA will exist respectively.

predominantly in the ionic forms. Ionic compounds are not known to volatilize from water.

However, the undissociated portion of TPA may volatilize from water.

5.2.2.6 Environmental Concentrations

Water Concentrations

TPA was detected in concentrations of 1.1 ppb to 3.4 ppb in polluted river water, but

none was detected in unpolluted waters (HSDB 1987).

Atmospheric Concentrations

TPA was qualitatively detected in the gas phase of urban air from Belgium. It was also

qualitatively detected in the air particulate matter collected from Tokyo, Japan. TPA was

detected in atmospheric aerosol and in rainwater particle extracts from West Los Angeles, CA.

(HSDB 1987).

The average concentrations of TPA in airborne aerosols from two relatively unpolluted

mountainous regions of Japan were 11.1 ng/m³ and 3.9 ng/ m³ (HSDB 1987).

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5.2.3 BIDS Simulants

5.2.3.1 Bacillus Subtilis

Physical Structure

Rod shaped microorganism

General Description

Bacillus subtillus is aerobic and very common in soil. Though it may occasionally cause

infections of the eye, lung, and soft tissues, B. subtilis is generally harmless to man (Fuerst

1983, Sherris and Ryan 1984). In the laboratory, B. subtilis produces the antibiotic bacitracin

(Fuerst 1983). B. subtilis forms endospores that can endure adverse conditions and some

disinfectants. However, it can be destroyed by heating 10 - 15 min at 100°C in moist heat or 1

hour at 150°C in dry heat (Pelczar and Reid 1965). B subtilis is used as a pesticide applied to

seeds of soybeans. It colonizes the root system of the plant and competes with disease-

causing organisms (EPA 1992b).

B. subtillus is also used in laundry detergents. It can be a severe eye irritant and is

poisonous via intraperitoneal exposure. When heated to decomposition, it produces noxious

ammonia-like fumes (Lewis 1992).

Environmental Fate

B. subtillus is found virtually everywhere. Data for environmental fate were not included

because the organism is a naturally occurring species. Bacillus is not expected to be

pathogenic or toxic to aquatic organisms, wild mammals, or non-target insects including honey

bees (EPA 1992b).

5.2.3.2 Male Specific Coliphage (MS2)

Physical Structure

Polyhedral shaped virus

General Description

Coliphage is a virus that attacks the bacteria Escherichia coli. It is <1 µ in diameter and

has a tail-like appendage that allows attachment to the host (Pelczar and Reid 1965). Male

Specific Coliphage (MS2) is relatively resistant to disinfectant, although it is inactivated by

monochloramine (Berman et al. 1992). Coliphage behaves similarly to polio viruses (Maillard

et al. 1994).

Environmental Fate

Male Specific Coliphage is found regularly in the natural environment as well as in

waste water treatment plants (University of Louisville, Life Sciences Division Environmental

Data Base 1996).

5.2.3.3 Erwinea herbicola

Physical Structure

Rod shaped bacteria

General Description

The genus Erwinea belongs to the family Enterobacteriaceae. Erwinea are gram-

negative, motile rods. Some species of Erwinea are plant pathogens (Pelczar and Reid 1965),

however Erwinia herbicola is described as a non-pathogenic bacteria which reduces the

incidence of fire blight in fruit trees. Under normal circumstances the bacteria is non-harmful to

plants or animals, however eye irritation may occur (EPA 1992b). E. herbicola occurs naturally

in the environment as a soil epiphytic bacterium.

Environmental Fate

Because the organism is considered harmless, no literature was found on the

environmental effects of released E. herbicola or the fate of E. herbicola in the environment.

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5.2.3.4 Ovalbumin

Chemical Structure

Single polypeptide chain of about 400 residues, phosphate residues, and a side chain

of manose and glucosamine.

General Description

The major protein component of chicken egg white, ovalbumin makes up 75% of the

egg albumin.

Environmental Fate

Because ovalbumin is a naturally occurring protein, no literature was found on the

environmental effects of released ovalbumin or it's fate in the environment.

5.2.3.5 Kaolin Dust

Chemical Structure

H₂Al₂Si₂O₈ • H20 (approximately)

General Description

Kaolin, the purest form of clay, is formed naturally from decomposition of feldspar

minerals. It is a hydrated aluminum silicate that is non-toxic and non-combustible. Kaolin is a

stable, off-white or yellow powder (Sigma Chemical Co. 1994b, Lewis 1992). It is insoluble in

ether, alcohol, alkali solutions, and dilute acids.

Kaolin related clays occur in several types of deposits. Many kaolin deposits

throughout the world are tabular lenses and discontinuous beds in sedimentary rock.

Extensive sedimentary deposits of this type occur in the Georgia-South Carolina kaolin belt,

Arkansas bauxite region, and one district in California.

Environmental Fate

No information available.

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5.2.4 FOX Simulants

5.2.4.1 Anisole

Chemical Structure

C₇H₈O

General Description

Synonym for methoxybenzene. Anisole, a phenol, is a clear, straw color liquid with an anise-like odor. It is insoluble in water, soluble in alcohol and ether, and is flammable. Anisole is used as a solvent, vermicide, and chemical intermediate. It also is used in perfume and flavoring industries (Hawley 1977). Anisole was identified as a compound isolated from essential oil of *Ocumum selloi*.

Environmental Fate

No information available.

5.2.4.2 Benzaldehyde

Chemical Structure

C7H6O

General Description

Benzaldehyde, an aromatic compound, is a colorless liquid with bitter almond odor (HMIS 1994). It is volatile and combustible (Hawley 1977). Benzaldehyde is slightly soluble in water, and miscible in ether and alcohol (Lewis 1992). The compound is a natural chemical found in plants and animals. As artificial almond oil, benzaldehyde is used in food, beverage, pharmaceutical, perfume, soap, and dye industries (Lewis 1994, USDHHS 1994b). Benzaldehyde is released to the environment in emissions from combustion of gasoline and diesel fuels.

Environmental Fate

If released to the atmosphere, benzaldehyde degrades by reaction with photochemically produced hydroxyl radicals; direct photolysis may contribute to its atmospheric degradation. Physical removal from air by wet deposition can occur. If released to soil or water, the major degradation pathway is expected to be biodegradation. Physical transport from water can occur through volatilization. Benzaldehyde will leach into the soil (HSDB 1987).

5.2.4.3 Cyclohexanone

Chemical Structure

C₆H₁₀O

General Description

Cyclohexanone is a flammable, colorless liquid with an acetone-like odor. It is soluble in water and miscible in most organic solvents (Miall and Sharp 1968). Uses include an intermediate in chemical synthesis, manufacture of artificial leather, plastics, and nylon, and formulation of solvents (Hawley 1977).

Environmental Fate

Cyclohexanone has high mobility in soil, and volatilizes from surface soils. It biodegrades in aerobic biodegradation screening tests and river die-away tests and therefore would be expected to biodegrade in soil. If released in water, cyclohexanone is slowly lost by volatilization. It's estimated half life in a model river and model lake is from 4.1 to 33 days. It would also be expected to biodegrade, but rates in natural water are unavailable. It is not expected to adsorb to sediment or particulate matter in the water column or bioconcentrate in aquatic organisms. In the atmosphere, cyclohexanone will degrade by reacting with photochemically-produced hydroxyl radicals. The general population is exposed to cyclohexanone from ambient air and possibly from contaminated drinking water (HSDB 1987).

5.2.4.4 Diethyl Malonate (DEM)

Chemical Structure

 $CH_2(COOC_2H_5)_2$

General Description

DEM is an ester, and is otherwise known as ethyl malonate. DEM is a colorless liquid with a sweet ester odor. It is insoluble in water, but soluble in organic solvents. It is combustible when exposed to heat or flame and may react with oxidizing materials (Lewis 1992). DEM is used as a chemical intermediate for barbiturates and pigments, and is also in

food flavoring (Hawley 1977).

Environmental Fate

DEM is likely to hydrolyze in soil or leach into groundwater (where is should completely hydrolyze). It will not volatilize significantly from soil. In water, DEM should hydrolyze but it will neither readily evaporate, adsorb to sediments or bioconcentrate in aquatic organisms. Oxidation of DEM by hydroxyl radicals may occur in water. No information on the

biodegradation of DEM in water or soil was available.

5.2.4.5 Diethyl Phthalate (DEP)

Chemical Structure

 $C_6H_4(CO_2C_2H_5)_2$

General Description

Also called ethyl phthalate, DEP is a stable, water-white, odorless, liquid with bitter taste. It is insoluble in water but soluble in organic solvents. It is combustible. DEP is useful as a plasticizer due to stability and low vapor pressure (Miall and Sharp 1968). It may also be used as a chemical solvent, wetting agent, insecticidal spray, and perfume fixative (Hawley 1977).

Environmental Fate

If released into the soil, DEP is expected to undergo aerobic biodegradation. Oxidation, chemical hydrolysis and volatilization from wet surfaces are not expected to be significant fate processes. DEP may volatilize from dry surfaces. If released into water, DEP is expected to biodegrade. Anaerobic biodegradation would be very slow or not occur at all. Volatilization should not be an important removal process in most bodies of water although it may be important in shallow rivers. Removal by oxidation, chemical hydrolysis, direct photolysis, indirect photolysis or bioaccumulation in aquatic organisms should not be significant. If released into the atmosphere, DEP is expected to exist in vapor form, and as adsorbed matter on airborne particulates. DEP vapor is expected to react with photochemically generated hydroxyl radicals. Physical removal by particulate settling and washout in precipitation will also occur (HSDB 1987).

5.2.4.6 Dimethyl phthalate (DMP)

Chemical Structure

C₆H₄(COOH₃)₂

General Description

Dimethyl phthalate is a colorless and odorless liquid that is insoluble in water. It is combustible when exposed to flame. It is used in formulations of plastics, insecticides, pesticides, fungicides, detergents, munitions, industrial oils and defoaming agents (Hawley 1977, Pierce et al. 1980).

Environmental Fate

The primary loss mechanism of DMP appears to be biodegradation. Half-lives of 8 - 11 days and 0.2 days have been found in river water, but no half-life is available for soil or groundwater. DMP is utilized by soil microorganisms and degrades under anaerobic conditions. Little adsorption to soil or sediment will occur. DMP will not bioconcentrate in fish. If DMP is emitted into the atmosphere, it will most likely be as an aerosol and it will be subject to rainout and gravitational settling. Photodegradation by hydroxyl radicals will also occur (HSDB 1987).

5.2.4.7 Ethyl Phthalate

Chemical Structure

C₆H₄(CO₂CH₂CH₃)₂

General Description

Ethyl phthalate has been used in industrial nations as a plasticizer, and in cosmetics, insect repellents and munitions. Ethyl phthalate is an odorless, clear, colorless, oily liquid with

a bitter taste. It is soluble in alcohol, ether, benzene, and moderately soluble in aliphatic

solvents (MSDS Fischer Scientific).

Environmental Fate

Like most other phthalate esters, ethyl phthalate is not readily volatilized from aquatic

environments. It is also not hydrolyzed in aquatic environments. The chief degradation

process is through enzymatic routes. Ethyl phthalate is readily degraded (fish 99% clearance

in 24 hours). Ethyl phthalate will bioaccumulate under conditions of continuous exposure,

however biomagnification is not expected to be significant (Pierce et al. 1980). In general,

ethyl phthalate is not persistent in the environment (Woodward 1986).

5.2.4.8 Eucalyptol

Chemical Structure

C₁₀H₁₈O

General Description

A terpene ether, also called cineol and cajeputol. An essential oil produced by distilling

oil from trees in the genus Eucalyptus. Each species of tree produces a different oil.

Eucalyptol is colorless with camphor-like odor, slightly soluble in water, and miscible with

organic solvents (Hawley 1977). Eucalyptol is used in pharmaceutical manufacturing and the

flavoring and perfume industries.

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Environmental Fate

No information available.

5.2.4.9 Methyl Salicylate (MES)

Chemical Structure

C₈H₈O₃

General Description

Methyl salicylate is a colorless, reddish, or yellowish, oily liquid ester with a wintergreen taste and odor. Methyl salicylate is only slightly soluble in water and is soluble in organic solvents (HMIS 1994, Lewis 1992). It occurs naturally in plants including wintergreen and birch and is found in cherry, apple, and raspberry juices (Opdyke 1979).

Environmental Fate

MES is likely to biodegrade in soil. In alkaline soil, chemical hydrolysis may contribute to its degradation. It may also undergo direct photolysis on the surface. MES is expected to be fairly mobile in soil. If released in water, MES should slowly volatilize, biodegrade, and be lost as a result of direct photolysis and photo-oxidation in surface waters. In alkaline water, hydrolysis may also be a significant fate process. MES is not likely to bioaccumulate in aquatic organisms. MES will react with photochemically-produce hydroxyl radicals in the atmosphere resulting in a estimated half-life of 1.4 days. It is relatively soluble in water and may be washed out by rain.

5.2.4.10 Sodium Carbonate (a Chemical Constituent of Soman, PCAS)

Chemical Structure

CO₃-2NA

General Description

Sodium carbonate is a white, odorless, crystalline powder with an alkali taste. It is hygroscopic and soluble in water. Sodium carbonate is also known as carbonic acid.

Environmental Fate

No information on the environmental fate of sodium carbonate is available.

5.2.4.11 Polyethylene Oxide (a Chemical Constituent of Soman, PCAS)

Chemical Structure

 $[C_2H_4O]_nH$

General Description

Polyethylene oxide is a colorless, flammable gas at ordinary room temperature and pressure, however it is in it's liquid form below 12 bars. Polyethylene oxide is soluble in water, alcohol, and ether.

Environmental Fate

No information available.

5.2.4.12 Hydroxyl Ethyl Cellulose (a Chemical Constituent of Soman, PCAS)

Chemical Structure

No information available.

General Description

Hydroxyethyl cellulose is a cellulose ether that is water soluble and non-ionic. Hydroxyethyl cellulose is used for thickening, stabilizing, and suspending other compounds (Hawley 1977). Ethyl cellulose is a odorless, white powder. It is commercially used in hot-melt adhesives, resins, oils, and plasticizers (Lewis 1992). It is soluble in most organic liquids and insoluble in water and glycerol (Lewis 1992).

Environmental Fate

Ethyl cellulose is not a risk to human or animal health (Scientific Polymer Products Inc. 1994). It is not toxic or carcinogenic.

5.2.4.13 Glycerol (a Chemical Constituent of Soman, PCAS)

Chemical Structure

C₃H₅(OH)₃

General Description

A trihydric alcohol, glycerol is a colorless, odorless, hygroscopic liquid. It is miscible with water and alcohol (Hawley 1977, Miall and Sharp 1968). Uses include explosives, soaps, lubricants, gums, and plastics.

Environmental Fate

No information available.

5.2.4.14 Diethyl Malonate (DEM) (a Chemical Constituent of Soman, PCAS)

Information on DEM can be found in Section 5.2.4.4.

5.2.4.15 Ferrous Ammonium Sulfate (a Chemical Constituent of Mustard Lewisite, PCAS)

No information on ferrous ammonium sulfate was available.

5.2.4.16 Polyethylene Oxide (a Chemical Constituent of Mustard Lewisite, PCAS)

Information regarding this chemical is provided in Section 5.2.4.11.

5.2.4.17 Hydroxyl Ethyl Cellulose (a Chemical Constituent of Mustard Lewisite, PCAS)

Information regarding this chemical is provided in Section 5.2.4.12.

5.2.4.18 Glycerol (a Chemical Constituent of Mustard Lewisite, PCAS)

Information regarding this chemical is provided in Section 5.2.4.13.

5.2.4.19 Methyl Salicylate (MES) (a Chemical Constituent of Mustard Lewisite, PCAS)

Information regarding this chemical is provided in Section 5.2.4.9.

5.2.4.20 2-2 Dipyridyl (a Chemical Constituent of CADS, PCAS)

Chemical Structure

C₁₀H₈N₂

General Description

2-2 Dipyridyl is an intermediate/product from manufacture of paraquat. It is found in waste water from paraquat production.

Environmental Fate

In aquatic systems, 2,2 Dipyridyl is not expected to bioconcentrate. It undergoes slow oxidation with photochemically generated hydroxyl radicals in aqueous solutions. 2,2 Dipyridyl should not partition from the water column to organic matter contained in sediments and suspended solids; and it should be highly mobile in soil and may leach to ground water. In the atmosphere, 2,2 Dipyridyl is expected to exist in both vapor and particulate phases. Vapor phase reactions with photochemically produced hydroxyl radicals should be important. In addition, 2,2 Dipyridyl has the potential to be physically removed from the air by wet deposition (HSDB 1987).

5.2.4.21 Phenolphthalein (a Chemical Constituent of CADS, PCAS)

Chemical Structure

C₂₀H₁₄O₄

General Description

Phenolphthalein is a colorless, tasteless compound with small crystal physical characteristics (Dietz et al. 1992, Lewis 1992). It is insoluble in water and very soluble in

chloroform (Lewis 1992). Phenolphthalein is widely used medically in laxatives, and chemically as an indicator agent.

Environmental Fate

No information available.

5.2.4.22 Isopropyl Alcohol (a Chemical Constituent of CADS, PCAS)

Chemical Structure

(CH₃)₂CHOH

General Description

Isopropyl alcohol is a colorless, volatile liquid that is highly flammable. It is infinitely soluble in water and is miscible in organic solvents. "Rubbing alcohol" consists of 30% water and 70% isopropyl alcohol (NIOSH 1976). Isopropyl alcohol is used to produce acetone, as a solvent, and in cosmetics and pharmaceuticals.

Environmental Fate

When isopropanol is released on land, it is apt to volatilize and leach into ground water and possibly biodegrade. Its fate in ground water is unknown. When released into water, isopropanol will volatilize and biodegrade. It will not adsorb to sediment or bioconcentrate in fish. In the atmosphere it will photodegrade primarily by reaction with hydroxyl radicals.

5.2.5 Non-specific Simulants

5.2.5.1 Titanium Dioxide

Chemical Structure

TiO₂

General Description

Titanium dioxide is a white amorphous powder used in military training to simulate

brass. It is insoluble in water and hydrochloric acid, but dilutes in sulfuric acid and alcohol.

Titanium dioxide is generally considered a nuisance dust (Hawley 1977).

Environmental Fate

A literature search revealed no information on the aquatic fate of titanium dioxide.

However, Haley and Kurnas (1993) found TiO2 eventually settles out of solution to the

substrate below.

5.2.5.2 PEG 200 (Polyethylene Glycol)

Chemical Structure

(-CH2CH2O-)n, where n>=4. In general, each PEG is followed by a number indicating

its general molecular weight, 200 in this case).

General Description.

PEG is a clear, viscous liquid or white solid which dissolves in water forming

transparent solutions. It is soluble in many organic solvents. It is readily soluble in aliphatic

hydrocarbons and has a sweet taste. Polyethylene glycols are used primarily as reactive

intermediates for the manufacture of fatty acid ester surfactants and as solvents for gasoline

processing. These compounds are also used as bases for cosmetic creams and lotions,

pharmaceutical ointments, toothpaste formulations, binders, plasticizers, molding compounds,

stiffening agents, and paper adhesives (HSDB 1987).

Environmental Fate

Due to it's high molecular weight and high viscosity, PEG has a low volatility. It is very

soluble in water and is dissipated in water easily. A biochemical study of the biodegradation of

PEG has shown that a number of microorganisms are capable of using PEG 200 and closely

related compounds as a source of carbon and energy.

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APPENDIX EFFECT OF SELECTED CHEMICALS ON INDIANA BATS, GRAY BATS, AND BALD EAGLES AT FORT LEONARD WOOD, MISSOURI

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5.3 FREQUENCY AND EXPECTED USE

Table 9 summarizes the frequency and expected use of chemical stressors included in this ERA. Chemicals listed in Table 9 were carried through a screening risk assessment to develop a final list of chemicals of potential concern.

The frequency of mobile fog oil training we assessed was based on the estimated time each mobile smoke training area can be used. Pasquill categories, weather conditions, and other limiting factors defined in the Fort Leonard Wood air permit limit the time mobile smoke training can occur on each mobile smoke training area. We estimate conditions will permit deployment of fog oil no more than 20% of days each year on Ballard Hollow, 25% on Cannon Range (Mush Paddle Hollow), 40% on Musgrave Hollow, and 30% on Bailey McCann Hollow. The percentage of time each mobile smoke range can be used was assumed to be equal to the percentage of gallons to be used on the installation in a year. The analysis of effects of mobile fog oil training was based on the number of gallons of fog oil to be deployed at each mobile smoke training area (Attachment I, Table I-5).

TABLE 9. Properties of chemical stressors.

•					
Chemical Stressor	Intended Use	Maximum Daily Quantity	Expected Yearly Quantity	Frequency of Use (Day and Night)	Location of Use
Smokes and Obscurants					
Fog Oil	Smoke obscurant	1200 gallons	static (gal) OPTM: 8500	static: 7.1 days per year	Smoke Training
			mobile (gal) OPTM: 76,000	mobile: 63 days per year	Areas
ТРА	smoke obscurant				
M83	smoke obscurant	141 maximum	3136 units	131 days per year	22 smoke
			2242 grenades		training
			from 1 November		locations
			through 15 March		
M8 TA, TPA smoke pots		59 maximum	950 units	16 days per year	9 smoke pot
	obscurant				training locations
BIDS and FOX I raining Simulants					
Bacillus subtillus	simulate biological	IE б	180 ml	20 days per year (indoors)	BIDS
	warfare agent	1.5 kg	22.5 kg	15 training days (outdoors)	Exterior
Male specific coliphage	simulate biological warfare agent	E O	180 ml	20 days per year	BIDS (outdoors)
Erwinia herbicola	simulate	Jm 6	180 ml	20 days per year	BIDS
	biological warfare agent				(outdoors)

Chemical Stressor	Intended Use	Maximum Daily Quantity	Expected Yearly Quantity	Frequency of Use (Day and Night)	Location of Use
Ovalbumin	simulate biological warfare agent	9 ml	180 ml	20 days per year	BIDS (outdoors)
Kaolin	simulate biological warfare agent	5.5 kg	11 kg	2 days per year	BIDS (outdoors)
Anisole	FOX simulant	9 ml	30 ml	approx. 4 days per year	FOX (indoors)
Benzaldehyde	FOX simulant	5 ml	30 ml	6 days per year	FOX (indoors)
Cyclohexanone	FOX simulant	5 ml	30 ml	6 days per year	FOX (indoors)
DEM - Diethyl malonate	FOX simulant	5 ml	19.03 I	6 days per year	FOX (indoors)
Diethyl phthalate	FOX simulant	200 ml	1.21	approx. 10. days per year	FOX (indoors)
Dimethyl phthalate	FOX simulant	2 ml 8 ml	12 ml 48 ml	6 days per year 6 days per year	FOX (indoors)
Ethyl phthalate	FOX simulant	1 ml 4 ml	6 ml 24 ml	6 days per year 6 days per year	FOX (indoors)
Eucalyptol	FOX simulant	_	19	6 days per year	FOX (indoors)
MES - Methyl Salicylate	FOX simulant	5 ml	15.03	6 days per year	FOX (indoors)
Persistent Chemical Agent Simulants (PCAS)					
Soman (GD)	PCAS	<u>-</u> 6	1800 I	200 days per year	Chemical Training Courses (outdoors)

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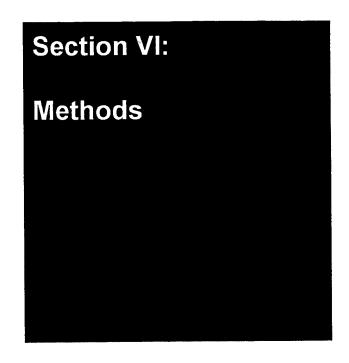
Chemical Stressor	Intended Use	Maximum Daily Quantity	Expected Yearly Quantity	Frequency of Use (Day and Night)	Location of Use
Sodium carbonate (2%)	PCAS	0.181	36 I	200 days per year	Courses
					(outdoors)
Polyethylene oxide (1%)	PCAS	0.091	181	200 days per year	Chemical
					Training
					Courses
					(outdoors)
Hydroxyethyl cellulose	PCAS	0.04	7.21	200 days per year	Chemical
(0.4%)					Training
					Courses
					(Singalia)
Glycerol (10%)	PCAS	16.0	180	200 days per year	Chemical
					liallilly Courses
					(outdoors)
Diethyl malonate (13%)	DCAS	121	1786	200 days ner year	Chemical
) 5	-			Training
					Courses
					(outdoors)
Mustard Lewisite	PCAS	16	1800	200 days per year	Chemical
					Training
					Courses
					(outdoors)
Ferrous ammonium sulfate	PCAS	180 ml	361	200 days per year	Chemical
(2%)					Training
			444.4		Courses
					(outdoors)
Polyethylene oxide (0.3%)	PCAS	27 ml	5.41	200 days per year	Chemical
					Training
					Courses
					(outdoors)
Hydroxyethyl cellulose (0.4%)	PCAS	36 ml	7.21	200 days per year	Chemical

		Maximum Daily	Expected Yearly	Frequency of Use	Location of
Chemical Stressor	Intended Use	Quantity	Quantity	(Day and Night)	Use
					Training
					Courses
					(outdoors)
Glycerol (10%)	PCAS	900 ml	180	200 days per year	Chemical
					Training
					Courses
Methyl salicylate (13%)	PCAS	1170 ml	234	200 days per year	Chemical
					Training
					Courses
					(outdoors)
CADS	PCAS	9 pts	1800 pts	200 days per year	Chemical
					Training
					Courses
					(outdoors)
2,2 Dipyridyl (0.5%)	PCAS	0.045 pts	9 pts	200 days per year	Chemical
					Training
					Courses
					(outdoors)
Phenophthalein (1%)	PCAS	0.09 pts	18 pts	200 days per year	Chemical
					Training
					Courses
					(outdoors)
Isopropanol (70%)	PCAS	6.3 pts	1260 pts	200 days per year	Chemical
					Training
					Courses
					(outdoors)
Non-specific Simulants					
Titanium dioxide M82 grenade	Simulates brass	24 units	48 units	2 days per year	22 Grenade
	obscurant				Training
	grenades				Locations
PEG 200 (mixed butyl mercaptan)	Simulates toxic rain attack	٩V	50 gallons	V V	Maximum of 8

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Section 6 Methods



6.1 CAVE MAPPING

Volumes and dimensions of Brooks, Wolf Den, Davis No. 2, Saltpeter No. 3, Freeman, and Joy caves were determined to model air flow and stressor movement within the caves.

6.2 CAVE METEOROLOGICAL AIR FLOW STUDIES

To determine chemical stressor behavior in endangered bat caves, we monitored cave climatic conditions. Meteorological stations were designed to collect climate information inside and outside caves. Meteorological stations were installed at each of the 4 Indiana bat hibernacula (Brooks, Wolf Den, Davis No. 2 and Joy caves), and two gray bat caves (Saltpeter No. 3 and Freeman caves). There were two meteorological stations at each cave. External stations were set up approximately 9 m from the outside of the entrance of caves and internal stations were approximately 30 m from the entrance of the caves.

Each external meteorological station consisted of the following: a 2-m tripod with lightning rod; solar panel; temperature/relative humidity sensor; barometric pressure sensor; anemometer; wind vane; antenna; and control box with interface, computer interface module, battery, cellular transceiver, and storage module. Internal stations have the following components: a 2-m tripod, small box with barometric pressure sensor, temperature/relative humidity sensor, anemometer and wind vane.

6.2.1 Determination of Mixing Constants

We measured the mixing constant in each of the 6 bat caves at Fort Leonard Wood. A particle mist nebulizer was used to generate particles in each of the caves. We used a Met One particle cell counter to determine the concentration and size of particles remaining in the air over a period of time. We used this information to calculate the mixing constant for each cave based on the size of the particles and amount of time they remained in the air after generation and release.

6.2.2 Monitoring Bat Roost Locations in the Caves

One bat roost was selected within each cave. Each location was equipped with a HOBO® barometric pressure mini datalogger sensor, a HOBO® temperature mini datalogger sensor, and a Stowaway™ relative humidity mini datalogger sensor. Data were downloaded using Logbook® software.

6.2.3 Maintenance of Meteorological Stations

Stations were maintained every 30 days or as needed. An IBM Thinkpad laptop computer equipped with PC 208 software was used to download data from the weather stations. A computer in Cincinnati, Ohio, downloaded data from the computers at Brooks, Wolf Den, Joy, and Freeman Caves via modem. Cellular phone coverage could not reach Saltpeter No. 3 and Davis No. 2, presumably because of topography. The transceivers were taken out of these 2 stations to reduce battery use. As a result, Saltpeter No. 3, Joy, and Davis No. 2 were visited every 30 days to download the data. If the computer in Cincinnati had trouble communicating with a station between visits, that station was checked. As photoperiod shortened, solar panels failed to fully charge batteries at all caves except Freeman. To remedy this, 12-volt marine batteries were added to the 6 cave stations.

6.2.4 Air Dispersion Modeling for Exposure Concentrations

The complex air flow patterns in caves make detailed mathematical modeling of smoke transport and diffusion into caves difficult and time consuming. However, simple material balances can be used to estimate and interpret real time exposure data from external smoke sources so that the cave roost/hibernation area mixing factor can be determined. By using this

method the cave smoke intake and dilution characteristics can be estimated to determine the smoke exposure level and ascertain if the exposure level is below acceptable limits.

A material balance method for work area rooms is described in a National Institute for Occupational Safety and Health (NIOSH) report, "Analyzing Workplace Exposures Using Direct Reading Instruments and Video Exposure Monitoring Techniques" (1992 U.S. Dept. of Health and Human Services). NIOSH uses this method to analyze and evaluate human exposure in enclosed, potentially contaminated work places. We used this method to evaluate the exposure of bats in caves to military smokes at Fort Leonard Wood.

6.2.4.1 Dilution Ventilation and Material Balance

The concentration of smoke at any time in a cave area can be expressed as a differential material balance. When integrated over an exposure period, the material balance provides a rational basis for relating cave ventilation rate to the generation and removal of smoke from a cave area. The material balance is

ACCUMULATION RATE = GENERATION RATE - REMOVAL RATE

$$VdC = Gdt - \frac{QC}{K}dt$$

where:

V = effective volume of the roost/hibernation area

C = concentration of smoke in the roost/hibernation area at time t

G = generation rate of smoke in the roost/hibernation area

t = time

Q = roost/hibernation area rate of ventilation (volume per unit time)

K = roost/hibernation area mixing constant.

d = derivative

Assuming the effective volume of the roost/hibernation area (V), the generation rate of the smoke (G) (which is assumed to be the product of the concentration from a distant smoke generator produced at the mouth of the cave and the rate of ventilation into the cave), the roost/hibernation area rate of ventilation (Q), and the mixing constant (K) during the smoke exposure are constant. Equation 1 can then be arranged as

$$\int_{C_{l_1}}^{C_{l_2}} \frac{dC}{G - \frac{QC}{K}} = \frac{1}{V} \int_{l_1}^{l_2} dt$$
 2.

where:

 C_{t1} = concentration at time t_1 C_{t2} = concentration at time t_2

Equation 2 can be solved to obtain

$$C_{t_2} = \frac{KG}{O} \left[1 - \exp(-\frac{Q}{KV}(t_2 - t_1)) \right] + C_{t_1} \exp(-\frac{Q}{KV}(t_2 - t_1))$$
 3.

Air changes per unit time (Q/V) is the ratio of roost/hibernation area rate of ventilation to the volume of the roost/hibernation area. When the roost/hibernation area is equally open at either end and not at least partially enclosed, the rate of ventilation is

$$Q = A_{\nu}^{\mathsf{O}}$$
 4.

where:

A =is the cross-sectional area of the roost/hibernation area V =is the normal flow velocity to the cross-sectional area.

Equation 4 also applies if the roost/ventilation area is room-like with a single opening for entrance and exit (that is the room door). In this case A is the cross-sectional area of the "room door" and $\stackrel{O}{v}$ is the net air velocity into or out of the room.

Equations 3 and 4 indicate the physical measurements of the cave required for estimating the smoke exposure in the roost/hibernation area. We measured temperature, barometric pressure, air speed and direction, and relative humidity are being measured inside and outside caves to compute or measure directly the ventilation rate, or air velocity normal to cross-sectional area of the roost/hibernation area. We measured the cave roost/area cross-sectional areas and room volumes. The generation rate of smoke in the roost/hibernation area is

$$G = C_{smake} Q_{cave}$$
 5.

where:

 C_{smoke} = concentration of smoke at the entrance to the cave as computed by an atmospheric transport and diffusion model for smokes such as TREMS1. Q_{cave} = cave entrance ventilation rate which functionally is the same as that expressed by Eq. 4, except A is the cross-sectional area of the cave entrance and \hat{V} is the net velocity into the cave (which is determined for example by measurement of barometric pressure and temperature differences).

The mixing constant adjusts for incomplete mixing of the ventilation air in the roost/hibernation area. Like the ratio Q/V, the mixing constant, K, affects the rate at which an equilibrium concentration is reached and directly affects equilibrium concentration which Eq. 3 shows is

$$C_{t_2} = \frac{KG}{Q}$$
 6.

When smoke is no longer at the cave entrance, G=0, Eq. 3 reduces to an exponential decay of an equilibrate concentration. The mixing constant can be estimated by solving the following equation for K:

$$C_{t_2} = C_{t_1} \exp(-\frac{Q}{KV}(t_2 - t_1))$$
 7.

K is specific to the roost/hibernation area, location within the roost/hibernation, and other environmental conditions at the time of sampling. We measured K in all six caves using a continuous source of water vapor to establish an initial concentration which was then turned off and allowed to decay. The concentration as a function of time during concentration decay was then used to measure K at representative locations in the roost/hibernation area. If a particular K value is chosen for reference, values greater than the comparison value show the corresponding ventilation rate is less than the reference value and the decay of the smoke is slower than that corresponding to the reference value. Values less than the reference value show the corresponding ventilation rate is greater than the reference value and the decay of

the smoke is faster than that corresponding to the reference value. The build up and decay of smoke in a roost/hibernation area as well as the location of the bats in relation to the source of the smoke affect the concentration in the breathing zone of the bat, and thus real-time exposure data.

6.2.4.2 Selection Criteria for Air Dispersion Models

Smoke transport and diffusion models now commonly used in environmental evaluations for air quality and for first order tactical analysis by the Army use a Gaussian plume or puff analysis. These models assume the aerosol mass concentration distribution as a function of downwind distance from the source can be expressed as a Gaussian distribution. Implicit in this assumption is that the predicted mass concentrations represent spatial and time averages and that the meteorological conditions used for model input are constant for the prediction.

Meteorological conditions used in Gaussian plume models include:

- 1. plume axis wind speed,
- 2. wind speed as a function of altitude,
- 3. surface roughness,
- 4. atmospheric stability, and
- 5. height of inversion layers.

For a single source, the peak mass concentration as a function of downwind distance from the source is linearly proportional to the rate at which the smoke is produced and inversely proportional to the product of the wind speed and the horizontal and vertical standard deviations. The standard deviations in Gaussian aerosol transport and diffusion models are expressed as power laws of down wind distance with the exponents dependent on surface roughness and atmospheric stability.

Normally, within the first 2000 - 3000 m of the boundary layer wind speed increases with altitude. For example, wind speed at head height can be 5 - 7 times slower than at a 10 m height. One of the primary differences in various Gaussian plume models is how wind speed with altitude is treated. A common approach is to model the wind speed as increasing with altitude as a power law. The exponent in the wind speed with altitude power law is assumed to depend on surface roughness and atmospheric stability.

Surface roughness is a nonlinear parameter used to adjust the standard deviations in the Gaussian concentration distributions for terrain variations. For example, a 0.1 m surface roughness corresponds to flat terrain covered with 1 - 2 m high grass or bushes. A 1 m surface roughness corresponds to hilly terrain covered with 10 - 15 m high trees or an urban environment with numerous high buildings.

Atmospheric stability depends primarily on background wind speed, temperatures, and radiative loading. It can not be measured directly, and is normally expressed as Pasquill-Gifford (P - G) category A - G, A being highly unstable and G being highly stable. A and B P - G categories normally occur on sunny days between 1100 and 1400 h. C and D P - G categories normally occur on sunny days from about 0700 to 1000 h, and between 1400 and 1800 h. E, F, and G categories normally occur before 0700 h and after 1900 h. It is important to understand that atmospheric stability is a dynamic variable that can fluctuate over times of the order of minutes due to fluctuating radiative loading resulting from, for example, changes in cloud cover. Atmospheric stability is expressed in Gaussian plume models as changes in the standard deviations.

Heights of inversion layers can range from tens of meters to over 1000 m. Inversions occur where air at altitude becomes warmer than that at ground level. The inversion layer reflects the upward drift of a smoke plume back into that at lower altitudes making the smoke concentrations higher than would otherwise be expected. Height of the inversion layer can be highly variable, particularly in the early morning and late afternoon hours where cool air collects in shadowed valleys while air over ridges and hills exposed to sun light remains warm.

The net effect of all the above meteorological parameters on Gaussian plume transport and diffusion computations is to make mandatory localized and accurate measurements of meteorological conditions at least at sites where smokes are to be released, and more reasonably at downwind locations where smoke concentrations are significant. Meteorological measurements older than a few minutes and at locations several kilometers, much less several tens of kilometers, removed from the area in question are not appropriate for Gaussian plume models.

Atmospheric transport and diffusion models accepted by the Environmental Protection Agency assume some form of Gaussian transport and diffusion. These models are typically

fine-tuned (specialized standard deviations, etc.) for smoke releases from elevated sources over flat terrain with constant surface roughness and meteorological inputs that are representative of large surface areas and at elevated altitudes.

The Tactical Resources Evaluation Modeling System for liquid obscurants (TREMS1) uses a Gaussian plume model with Pasquill-Gifford stability expressions for plume concentration spatial standard deviations. The TREMS1 standard deviation values are commonly used in most accessible U.S. Army atmospheric transport and diffusion models. TREMS1 does not account directly for variability in terrain height relative to generator location. Terrain roughness is accounted for through values chosen for the downwind concentration standard deviations. TREMS1 assumes continuous smoke production and constant atmospheric conditions.

For the air dispersion computations herein, the computational output of TREMS1 was configured to produce contours of constant concentration at a fixed height relative to the source after the plume was established.

The EPA has not used TREMS1, and because the model does not directly account for terrain height variations, the validity and acceptability to the EPA of TREMS1 computational values is uncertain relative to models the EPA has used. During a meeting of support contractors assessing effects of smoke training at Fort Leonard Wood it was suggested the EPA recognized models INPUFF 2.3 and ISC 3.0 apparently provide for terrain variations and may more accurately yield a "better" estimate downwind smoke concentrations. Both INPUFF 2.3 and ISC 3.0 are Gaussian models. However, INPUFF produces a plume by requiring the source to produce a series of smoke puffs that are closely spaced in time, and can make allowance for temporal changes in meteorological conditions while TREMS1 and ISC 3.0 are true continuous source plume models.

Evaluation of INPUFF 2.3 shows the computational output format allows the user to specify "receptor" (that is, the concentration sample point) height as a function of downwind spatial grid location. However, examination of INPUFF 2.3 shows that the model does not directly account for terrain variations. It assumes flat terrain and that variations in terrain height are equivalent to simple changes in receptor height.

The concern expressed relative to the acceptability of TREMS1 to the EPA and its predictive accuracy for complex terrain led to work on a comparison of TREMS1, INPUFF 2.3, and ISC 3.0 to determine which model is best to use for Fort Leonard Wood smoke transport and diffusion environmental computations. The criteria for model selection included but were not necessarily limited to:

- 1. ease of use,
- 2. sensitivity to terrain variations or surface roughness,
- 3. applicability and acceptability for predicting U.S. Army smoke generator performance,
- 4. production of conservative predictions, and
- 5. acceptability of prediction results to the EPA and state authorities.

The first criteria reflects the desire to obtain predictions in an easily interpretable format by environmental analysts. The second and third criteria reflect a desire to have the model accurately describe source and terrain environment effects on smoke transport and diffusion. The forth and fifth criteria require predictions conservatively estimate the area coverage for a given concentration threshold, and that the results are acceptable to regulatory authorities. We used the fourth criterion as the basis of the selection of the air dispersion model for fog oil in the BRAC ERA. In the ecological risk assessment, the most conservative analysis is used to determine if an unacceptable exposure is occurring.

Section 7
Stressor Toxicity Profiles

Section VII:

Stressor Toxicity
Profiles

7.1 INTRODUCTION

To determine if species of concern will be exposed to "unsafe" or toxic concentrations of stressors, we identified concentrations that could cause an adverse effect.

Until recent years, most toxicology research and ecological risk assessment was focused on humans. There is an established EPA hierarchy to collect human toxicity data for human health risk assessments. There also is an established protocol on how to apply toxicity information. There is no established protocol for non-human species, ecosystems, communities, etc. Several guidance documents that provide insight and develop approaches to estimate toxic effects from environmental stressors are now available from EPA and DOD.

We evaluated each stressor for acute and chronic toxicological effects. Typically, acute effects are exhibited by organisms exposed to high concentrations over a short period of time. Acute toxicity tests are designed to assess short-term exposure. Acute exposure results from on exposure event. We did not consider short term simultaneous exposure to multiple stressors because there are no developed toxicological studies that examine all stressors in this study. Also, we were unable to accurately predict the simultaneous timing, area of use, and other factors needed to evaluate effects of multiple stressors.

Chronic toxicity tests assess long-term toxicological effects. These tests are used to determine if there are expected effects to the receptor after multiple exposures to a stressor. The EPA (1989) describes chronic exposure for humans as anything occurring for 7 years or 10% of the average human lifespan. Chronic tests include doses that are typically representative of expected field exposures.

This toxicity used in assessments established safe doses of stressors. For certain chemicals, the EPA has established a safe dose, called Reference Dose (RfD). The RfD is used to assess noncarcinogenic effects resulting from exposures at Superfund sites (EPA 1989). RfDs are published in the IRIS (Integrated Risk Information System) database. Many human RfDs are developed from animal toxicological studies. The RfD is based on the highest dose administered that does not cause an adverse effect (NOAEL = No Observable Adverse Effect Level).

Most human toxicity data is based on animal studies. Uncertainties exist when using a different test species (surrogate) than the study species. Uncertainty factors are used to lower the toxicity values in case the study organism is more sensitive, has different metabolic rates, or has other physiological or anatomical differences. There is uncertainty introduced in assuming the test organism will exhibit the same effect as manifested in the surrogate species. The EPA uses Uncertainty Factors (UF) to address this issue. The NOAEL for a surrogate species is divided by the product of UFs to yield a toxicity value for the test organism. A Lowest Observable Adverse Effect Level (LOAEL) is used if the NOAEL is not available. The study from which the NOAEL was selected is called the "critical study" and the effect manifested in the study is called the "critical effect."

There are few established toxicity values for wildlife or other non-human organisms. We developed toxicity values using methods similar to those used to develop mammalian RfDs. The Department of Defense (DOD) Procedural Guidelines for Ecological Risk Assessments at U.S. Army Sites (Wentsel 1994) refers to the use of Toxicity Reference Values (TRVs) in place of RfDs. We developed a TRV for inhalation, ingestion, and dermal absorption from toxicological studies. Calabrese and Baldwin (1993) outline another procedure to develop TRVs, but with slightly different UF adjustments. We used the decision tree with the uncertainty factor values presented in Wentsel et al. (1994). This procedure involves assumptions about the test species and the receptors in this analysis:

similar toxic response in test species and receptors

• similar pharmacodynamics

similar sensitivity to the stressor in test species and receptor

similar stressor behavior in test species and receptors

similar pharmacokinetics

We applied the UFs to reduce the NOAEL to account for differences in our receptors and the test species. UFs account for differences within species, between species, between toxicological values, sensitivities, and differences between taxonomic class of the test organism and the study species.

We evaluated oral ingestion, inhalation, and dermal absorption routes of exposure. Chemicals ingested enter the digestive system where they are metabolized or excreted. Effects from ingested stressors are typically shot-term, and alleviated with removal of the stressor. Absorption efficiency was not evaluated. Inhaled toxicants may damage the lungs and cause systemic effects. The lung membrane has a large surface area over which gas exchange occurs. Many toxicants irritate dermal coverings.

Toxicological responses vary with receptor species. Figures 6, 7, 8, and 9 illustrate the differences in anatomy and disease response for Indiana bats, gray bats, and baid eagles. Indiana bats and gray bats respond to contaminants similarly. Bald eagles have anatomical features that mammals lack (i.e. a crop and gizzard). Indiana bats, gray bats and bald eagles are affected by different toxicological effects from stressors (Figures 6, 7, 8, and 9).

7.2 SMOKE AND OBSCURANTS

7.2.1 Fog Oil

7.2.1.1 Chemical Structure

Hydrocarbons, C₅ to C₅₀

Studies referenced in this section were conducted on old fog oil. It is not known whether new fog oil will cause the same or similar effects as old fog oil. Because of the

FIGURE 6. Model of possible toxicological effects to Indiana bats and gray bats inhaling chemical stressors.

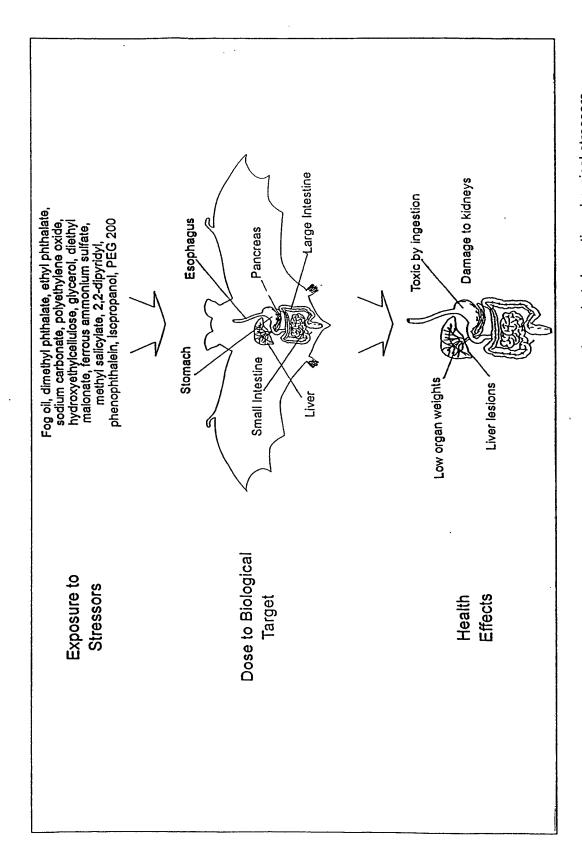


FIGURE 7. Model of possible toxicological effects to Indiana bats and gray bats ingesting chemical stressors.

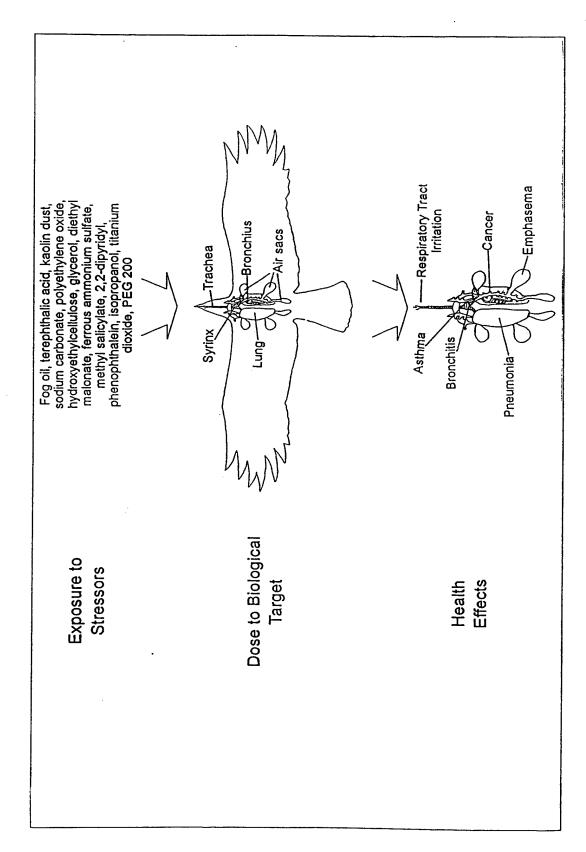


FIGURE 8. Model of possible toxicological effects to bald eagles inhaling chemical stressors.

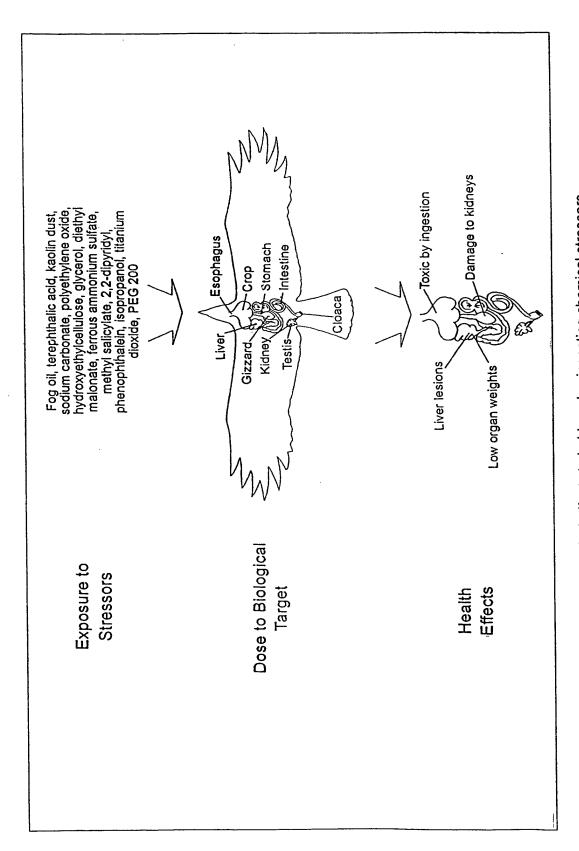


FIGURE 9. Model of possible toxicological effects to bald eagles ingesting chemical stressors.

extensive hydrotreating new fog oil undergoes before it is purchased by the military, toxicological effects and toxicity values from new fog oil are not expected to as severe as old fog oil. Hydrotreating of the new fog oil removes carcinogenic compounds.

7.2.1.2 Oral Ingestion

Acute toxicity of fog oil is low in animals (Palmer 1990). A similar petroleum product, white mineral oil, is lethal to mice in doses of 5 - 20 ml/kg (Driver et al. 1992). Repeated exposure to large doses may cause serious effects. Daily ingestion of 5 or 20 ml/kg white mineral oil caused weight loss, degeneration of liver and kidney, restlessness, and epidermal damage; animals died within 7 - 10 days (Mulhy et al. 1983). In rats and rabbits, ingestion of fog oil is rarely acutely toxic (Palmer 1990).

7.2.1.3 Dermal Absorption

Fog oil used for obscuration is not considered a skin sensitizer or eye irritant. In humans, short-term dermal exposure to petroleum oils may cause redness (Palmer 1990). Dermal application of 0.6 ml yellow or white lubricating oil on guinea pigs for 2 days caused redness, hyperkeratosis, and desquamation (Mulhy et al. 1983).

Prolonged or repeated skin exposure to petroleum products can cause reversible inflammation, acanthosis, and eczema (Palmer 1990, Smith et al. 1987). Repeated dermal exposure to refined oils (similar to fog oil) changed epidermal morphology and caused hair loss (Palmer 1990). The refining process of "new" fog oil removes a significant proportion of PAHs, and few chronic skin problems, including tumorigenesis, are expected (Palmer 1990).

7.2.1.4 Inhalation

The minute size of fog oil droplets (0.5 - 1 μ m) facilitates respiratory exposure (Palmer 1990, Young et al. 1989). Viscosity of fog oil is low and respiratory toxicity is lower than thicker oil mists (Driver et al. 1992). The LC₅₀ for rats was calculated at 5.2 mg/L in a single 3.5 hours exposure (Grose et al. 1985, Selgrade et al. 1987). Exposure of male rats to 1.5 mg/L fog oil for 6 hours per day for 2 days caused 70% mortality due to pulmonary hemorrhage (Selgrade et al. 1987). After inhalation of high doses (4330 - 4500 mg/m³) for 2 - 92 hours, mice retained significant amounts of oil in the bronchioles and alveoli and a few deaths occurred (Mulhy et al.

1983). The short-term exposure limit for human exposure to mineral oil (chemically and toxicologically similar to fog oil) is 10 mg/m³ for 15 min (Driver et al. 1992).

Adverse pulmonary and systemic effects may result from prolonged or repeated exposure to fog oil. In humans, exposure to refined oils may cause respiratory granulomas and pneumonias (Palmer 1990). Rats exposed to 1.5 mg/L SGF-2 fog oil for 4 weeks exhibited multi-focal pneumonitis, edema, and inflammation (Grose et al. 1986, Selgrade et al. 1987). These symptoms were rarely observed in rats exposed to 0.5 mg/L SGF-2 for 4 weeks (Selgrade et al. 1987). However, rats exposed to similar doses for 13 weeks had more severe histopathologic changes and pulmonary effects at lower doses (Selgrade et al. 1990). Exposure to fog oil for 4 - 13 weeks suppressed feeding and caused significant weight loss (Grose et al. 1985). None of these effects seemed life threatening and pulmonary functions such as total lung capacity, vital capacity, residual volume, diffusing capacity of CO₂, and lung compliance were unaffected by fog oil exposure (Grose et al. 1985, Selgrade et al. 1987).

Nearly all monkeys exposed to 63 mg/m³ SGF-1 fog oil died within one year, suffering from pneumonitis, other pulmonary damage, and severe gastritis (Lushbaugh 1950). Rats and dogs exposed to 100 mg/m³ mineral oil for one year also contracted pulmonary damage (Wagner et al. 1964). No pulmonary damage was caused in rats exposed to 5 mg/m³ mineral oil for one year (Wagner et al. 1964). An 8 hour time weighted average exposure limit of 5 mg/m³ is advised for humans (Palmer 1990).

7.2.1.5 Carcinogenicity/Teratogenicity

The International Agency for Research of Cancer lists some napthenic and paraffinic-based mineral oil as carcinogens or probable carcinogens. However, several studies of humans have found no association between inhalation of oil mist and lung cancer (Shinn et al. 1987). Chronic ingestion of highly refined mineral oils is not known to cause cancer in animals (Palmer 1990, Oser et al. 1965). No carcinogenic effects were observed in rats fed 2% liquid paraffin for 500 days or rats fed 5% petrolatum for two years (Palmer 1990). Liquid paraffin and petrolatum are similar to mineral oil. Oser et al. (1965) conducted a study that found no oil-related tumors observed in rats fed 5% diets of 3 grades of petrolatum for 2 years. Inhalation of 5 and 100 mg/m³ of mineral oil for 13 months caused no difference in the

incidence of tumors in mice (Palmer 1990). Studies of the carcinogenicity of "old" fog oil by dermal absorption are inconclusive (Palmer 1990).

Solvent refining processes are known to remove many cancer-causing factors, including PAHs, from "new" fog oil (Gehrart et al. 1988). However, Palmer (1990) found that stockpiles of fog oil may not be noncarcinogenic, especially if producers only use OSHA specifications as a guideline.

7.2.1.6 Wildlife Exposure

Little data exist describing the toxicity of fog oil to wildlife and all current available information is based on old fog oil. Small animals breathe a larger volume of air per unit body weight than humans; wildlife may be more susceptible to effects of inhalation of fog oil (Driver et al. 1992). Old fog oil has been proven to be weakly mutagenic to rodents exposed in the wild (Yanders et al. 1985). Herbivores may ingest oils from plants because petroleum oils are known to penetrate leaves, fruit, and tubers of some species (Mulhy et al. 1983). We found no evidence of fog oil accumulating in the environment or biota (especially vegetation) at Fort McClellan (see Section 10). Old fog oil can accumulate in food chains, especially in aquatic situations (Shinn et al. 1987). Oil coating water can deplete dissolved oxygen and asphyxiate aquatic organisms; however, tests indicate fog oil has limited potential to reduce dissolved oxygen (Driver et al. 1992).

Studies have shown effects of exposure to fog oil in waterfowl, aquatic organisms, and invertebrates. In ducks, ingestion of 20 mL/kg lubricating oil or 24 mL/kg diesel oil caused no mortality. Other studies revealed systemic damage from doses as low as 1 mL/kg lubricating oil or 3 mL/kg diesel oil (Mulhy et al. 1983). Coating of avian feathers with petroleum products may inhibit thermoregulation, buoyancy, and escape from predators (Driver et al. 1992). In quail, ingestion of 3.5 mL/kg of No. 2 fuel oil delayed egg production and caused abnormalities in egg formation (Mulhy et al. 1983). Painting shells of viable chicken eggs with 2 - 30 μ L crude oil caused edema in subcutaneous tissue, necrosis of liver, and dilation of heart and spleen of embryos. Coating less than 2% of the surface area of eggs with 1 μ L of No. 2 fuel oil was lethal to embryos (Driver et al. 1992). Toxicity of petroleum products to eggs may be related to PAH content of the oil. New fog oil contains little if any PAH compounds; it is assumed to have reduced toxicity.

Most species of fish can tolerate 24 hour exposures to 28 - 52.5 mg/L of No. 2 fuel oil added to water, although some minnows tolerate up to 260 mg/L (Mulhy et al. 1983). When No. 2 fuel oil was dissolved in water, tolerance to oil was much lower (3.9 - 6.9 mg/L). The fathead minnow (*Pimephales promelas*) was not adversely affected by 0.16 - 2.37 mg/L fog oil (Driver et al. 1992). Marine annelids tolerated 24 hour exposures to 8.7 mg/L No. 2 fuel oil dissolved in water (Mulhy et al. 1983). Fog oil residues of 285 μg/g (3600 μg/cm³) in soil had no apparent effect on survival of adult or larval earthworms (Driver et al. 1992). For the freshwater invertebrate, *Daphnia magna*, exposure to 8.96 mg/l of fog oil was lethal (Driver et al. 1992). Exposure to 12.5 mg/L No. 2 fuel oil in water was lethal to scallops within 24 hours (Mulhy et al. 1983). Exposure to 1000 mg/L No 2. fuel oil in water reduced development of oyster and mussel larvae (Mulhy et al. 1983). Larvae of marine shrimp tolerated 24 hour exposures to 2.6 - 5.0 mg/L No. 2 fuel oil dissolved in water (Mulhy et al. 1983). Larval shrimp tolerated smaller doses for longer exposures.

Impact areas for obscurant training are typically small (Driver et al. 1993) and Shinn et al. (1987) predicted toxic effects of fog oil clouds on terrestrial species will be minimal if testing is limited to short periods of time.

7.2.2 Terephthalic Acid

7.2.2.1 Chemical Structure

C₆H₄(COOH)₂

7.2.2.2 Oral Ingestion

Ingestion of a diet with 5% TPA for two years caused death in rats (Woodward 1986). The rats died primarily of nephropathy caused by bladder calculi. Damage to the ureter and urinary bladder also were observed. In other studies, ingestion of > 2% TPA for less than two weeks caused formation of uroliths (Woodward 1986); rats ingested 85 mg/kg of TPA with no accumulation or toxic effects (EPA 1982). Eastman Chemical Products, Inc. determined LD₅₀ of TPA to mice to be 6400 mg/kg (Moffit et al. 1975). NIOSH gives an oral LD₅₀ in rats for TPA of 18,800 mg/kg (EPA 1982).

7.2.2.3 Dermal Absorption

No evidence of skin irritation in rats was found after single and repeated application of

80 mg. This dose was also shown not to absorb into the skin or eyes of rabbits (Thomson et

al. 1988. Muse et al. 1995).

7.2.2.4 Inhalation

No adverse effects were observed in rats dosed with pyrotechnically disseminated TPA

(Muse et al. 1995, Thomson et al. 1988).

7.2.2.5 Carcinogenicity/Teratogenicity

Terephthalic acid induces bladder and uretal neoplasms in rats of both sexes when

administered at 5% (1000 mg/kg/day) of the diet and induces a high incidence of bladder

stones. No tumors or other toxic effects were found. Studies on rats and rabbits found no

teratogenic effects (EPA 1982).

7.2.2.6 Wildlife Exposure

An LC₅₀ of 36 - 40 mg/L has been calculated for the toad, *Bufo bufo japonicus*. Studies

with two fish species, fathead minnows and channel catfish, exposed to radio-labeled di-2-

ethylhexyl phthalate indicated that approximately 5% of the total accumulated radioactivity was

as phthalic acid (EPA 1982).

7.3 BIDS SIMULANTS

7.3.1 Bacillus Subtilis

7.3.1.1 Physical Structure

Rod shaped microorganism

7.3.1.2 Oral Ingestion

Ingestion of 1.9 x 108 CFU (colony forming units) of B. subtilis by rats caused no

symptoms of toxicity or infection (EPA 1992b). Studies show B. subtilis is not toxic, infective,

or pathogenic by oral exposure (EPA 1992b).

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7.3.1.3 Dermal Absorption

Humans and animals are exposed to B. subtilis found in soil world-wide. Studies show

B. subtilis is not pathogenic, infective, or toxic to animals by dermal exposure (EPA 1992b). A

dose of 3.6 x 109 CFU administered to skin of rabbits caused no toxic effects (EPA 1992b).

Protease type X-A from B. subtilis may cause allergic respiratory and skin reactions. B. subtilis

may cause infection when contacted via deep tissue wounds, but absorption from skin surface

rarely causes infection.

B. subtilis is irritating to mucous membranes and eyes (HMIS. 1994). Slight to severe

ocular irritation caused by 0.1 g of B. subtilis applied to the eye, dissipated within 1 week (EPA

1992b).

7.3.1.4 Inhalation

Intratracheal administration of 2.84 x 108 CFU of B. subtilis to rats caused no

pathogenic or toxic symptoms (EPA 1992b). B. subtilis is identified as a harmless, non-

pathogen by the Center for Disease Control and the National Institute of Health. There is no

evidence of pathogenicity in healthy adult humans or in animals. It is not thought to be

communicable from biota to humans. Exposure to large quantities of aerosolized B. subtilis

may cause allergic sensitization.

7.3.2 Male Specific Coliphage

7.3.2.1 Physical Structure

polyhedral shaped virus

7.3.2.2 Oral Ingestion

Male Specific Coliphage (MS2) is considered a human non-pathogen. It is fairly

common and is encountered in nature on a daily basis. There are no reported incidents of

human infection due to exposure to MS2, nor of associated health risks.

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7.3.2.3 Dermal Absorption

There are no reported incidents of human infection due to exposure to MS2, nor of associated health risks.

7.3.2.4 Inhalation

There are no reported incidents of human infection due to exposure to MS2, nor of associated health risks.

7.3.2.5 Carcinogenicity/Teratogenicity

There are no reported incidents of human infection due to exposure to MS2, nor of associated health risks.

7.3.3 Erwinea Herbicola

7.3.3.1 Physical Structure

Motile rod shaped microorganism

7.3.3.2 Oral Ingestion

Erwinea herbicola is considered a human non-pathogen. It is encountered in nature on a daily basis. There are no reported incidents of human infection due to exposure to *E. herbicola*, nor of associated health risks.

7.3.3.3 Dermal Absorption

There are few reported incidents of human infection due to dermal exposure to *E. herbicola*. Associated health risk is low. *E. herbicola* may cause infection when contacted via deep tissue wounds, but rarely is infective by absorption from surface of skin.

7.3.3.4 Inhalation

Personnel involved in shredding wood treated by *E. herbicola* may develop mucosal sensitization to associated endotoxins.

7.3.3.5 Carcinogenicity/Teratogenicity

There are no reported incidents of human infection due to exposure to E. herbicola, nor

of associated health risks.

7.3.4 Ovalbumin

7.3.4.1 Chemical Structure

A single polypeptide chain of about 400 residues, phosphate residues, and a side chain

of mannose and glucosamine.

7.3.4.2 Oral Ingestion

There are no reported incidents of toxicity effects due to exposure to ovalbumin, nor of

associated health risks.

7.3.4.3 Dermal Absorption

Risk is associated with allergic response especially in organisms sensitive to egg

products.

7.3.4.4 Inhalation

Asthma has been reported in workers subjected to repeated exposure to aerosolized

egg whites in poultry processing plants (Fine 1990). An aerosol of 11 - 31 mg/m³ containing

50% protein may cause allergies, especially in non-ventilated situations.

7.3.4.5 Carcinogenicity/Teratogenicity

No information is available about the carcinogenicity/teratogenicity of ovalbumin.

7.3.5 Kaolin Dust

7.3.5.1 Chemical Structure

H₂Al₂Si₂O₈·H20 (approximately)

7.3.5.2 Oral Ingestion

Oral TDLo for a female rat is 590 g/kg over a 37 day test period. Exposure may cause

stomach granuloma (USDHHS 1994a). Repeated ingestion of a diet containing 20% kaolin

has been associated with anemia and low birth-weight pups in pregnant rats (Patterson and

Staszak 1977).

7.3.5.3 Dermal Absorption

Brief contact may cause dermatitis and may be irritating to eyes (Lewis 1992).

7.3.5.4 Inhalation

Kaolin is registered as a nuisance dust. Toxicity depends upon SiO₂ content (Sax

1992). Acute and chronic effects of exposure to kaolin have not been thoroughly studied

(HMIS. 1994). Inhalation may cause local irritation of nose, throat, and lungs; short periods of

inhalation may cause asthma, edema, and hives (Lewis 1992). Chronic respiration of kaolin

may cause chronic bronchitis, pulmonary fibrosis, emphysema, bronchial asthma (Lewis 1992,

USDHHS 1994a). The exposure limit established by NIOSH and OSHA is time weighted

average (TWA) of 10 mg/m³ for total dust and TWA of 5 mg/m³ for the respirable fraction

(USDHHS 1994a).

7.3.5.5 Carcinogenicity/Teratogenicity

Kaolin is not classified as a human carcinogen (HMIS 1994, USDHHS 1994a).

Currently, no data concerning teratogenicity of ingested or inhaled kaolin are available.

7.4 FOX SIMULANTS

7.4.1 Anisole

7.4.1.1 Chemical Structure

C₇H₈O

7.4.1.2 Oral Ingestion

Anisole is recognized as a safe food additive by the Flavoring Extract Manufacturers'

Association and is approved by the FDA for use in foods. Anisole is moderately toxic when

ingested in large amounts. In rats and mice, the oral LD50 is 3700 mg/kg and 2800 mg/kg,

respectively (Aldrich Chemical Co. 1995, Lewis 1992). Ingestion of 50 mg per day for 10 days

caused no change or increased liver regeneration in rats (Gershbein 1977).

7.4.1.3 Dermal Absorption

Anisole can be a skin irritant; 500 mg/24 hours applied to rabbits caused moderate

irritation (redness and edema) (Lewis 1992). However, two-day application of 4% anisole (in

petrolatum) produced no irritation on human skin (Epstien 1976).

7.4.1.4 Inhalation

Inhalation of vaporous anisole is irritating to mucous membranes and upper respiratory

tract (Aldrich Chemical Co. 1995). In rats and mice, the LD₅₀ for inhaled anisole is > 5000

mg/m³/3 hours and 3021 mg/m³/2 hours (Aldrich Chemical Co. 1995).

7.4.1.5 Carcinogenicity/Teratogenicity

Anisole may be mildly tumor promoting. When a 20% solution of anisole in acetone

was applied twice weekly to the skin of female mice, 34 of 36 mice survived, but 9% had

papillomas and 3% had carcinomas (Boutwell and Bosch 1959).

7.4.2 Benzaldehyde

7.4.2.1 Chemical Structure

C₇H₆O

7.4.2.2 Oral Ingestion

Benzaldehyde is listed by the U.S. Food and Drug Administration as "generally-

recognized-as-safe" (USDHHS 1994b). Acute toxicity of benzaldehyde is relatively low. In

guinea pigs and rats, the oral LD₅₀ is 1000 - 1300 mg/kg (Aldrich Chemical Company. 1995,

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HMIS 1994, Lewis 1992, USDHHS 1994b). In mice, the oral LD₅₀ is 28 mg/kg (Aldrich Chemical Co. 1995, Lewis 1992). In rats, effects of acute exposure to 800 - 1600 mg/kg/day for 12 days included decrease in weight gain, hyperexcitability, tremors, inactivity, and death (Kluwe et al. 1983). These symptoms were not observed in mice that received similar doses. No gross lesions were detected in rats or mice upon necropsy. In humans, small doses cause central nervous system (CNS) depression (HMIS 1994) while larger doses cause convulsions. A dose of 600 - 900 mg/kg would likely cause death in humans (USDHHS 1994b). The acceptable daily intake (ADI) for humans, established by the Joint Expert Committee on Food Additives, is 0 - 5 mg/kg (USDHHS 1994b).

Toxic effects due to subchronic exposure to benzaldehyde resulted in mice and rats from ingestion of 800 mg/kg/day for 90 days (Kluwe et al. 1983). Symptoms included hyperactivity, trembling, and periodic inactivity. Necropsy revealed toxic lesions in brain, kidney, and forestomach. Necrosis of the cerebellum and hippocampus was found. These lesions were not present in groups of rats exposed to 400 mg/kg/day for 90 days. Considering this study, oral NOEL and LOAEL values were established at 143 mg/kg/day (corrected for chronic exposure) and 400 mg/kg/day, respectively and the RfD is 0.1 mg/kg/day (IRIS 1988). In other studies of effects of chronic (two year) exposure to benzaldehyde, abnormalities of the forestomach were observed, while lesions of kidney and brain did not develop (USDHHS 1994b).

7.4.2.3 Dermal absorption

Benzaldehyde is strongly irritating to human skin and may cause dermatitis (Lewis 1994, Lewis 1992, USDHHS 1994b). However, the compound is also reported to have local anesthetic properties (Lewis 1992). Moderate irritation (redness and edema) occurred within 24 hours following application of 500 mg to skin of rabbits (Lewis 1992).

7.4.2.4 Inhalation

Although benzaldehyde is a volatile compound, no information regarding effects of acute or chronic inhalation of benzaldehyde was found. However, the American Industrial Hygiene Association recommends an 8 hour TWA limit of 8.7 mg/m³ and a 15 min TWA of 17.4 mg/m³ (USDHHS 1994b).

7.4.2.5 Carcinogenicity/Teratogenicity

Ingestion of 200 - 400 mg/kg/day produced no evidence of carcinogenic activity in rats. There was limited evidence of carcinogenic activity in mice that received similar doses (USDHHS 1994b). Benzaldehyde has potential antitumor properties, and has been proposed as a chemothereputic agent. Benzaldehyde generally is non-genotoxic, but may produce weak mutagenic effects in some bioassays (USDHHS 1994b). The precautionary label on containers of benzaldehyde states it may cause genetic damage (Aldrich Chemical Co. 1995).

7.4.3 Cyclohexanone

7.4.3.1 Chemical Structure

C₆H₁₀O

7.4.3.2 Oral Ingestion

Cyclohexanone is moderately toxic by ingestion. The oral LD_{50} for rats and mice is 1535 mg/kg and 1400 mg/kg, respectively (Lewis 1992, Lijinsky and Kovatch 1986). Other studies report oral LD_{50} for mice as 2.1 g/kg (Gupta et al. 1979, Lijinsky and Kovatch 1986). Symptoms from ingestion of 1.13 - 2.11 g/kg included labored respiration, followed by death (Gupta et al. 1979).

Chronic (2 year) ingestion of 3300 - 6500 ppm cyclohexanone caused considerably reduced weight gain in rats. This effect was observed in mice exposed to 13,000 - 25,000 ppm cyclohexanone (Lijinsky and Kovatch 1986). Considering this study, oral NOAEL and LOAEL of 462 mg/kg/day and 910 mg/kg/day were established, and the oral RfD is 5 mg/kg/day (IRIS 1987). Survival of rats ingesting 25,000 and 13,000 ppm cyclohexane was 50% after one year (Lijinski and Kovatch 1986). In a National Cancer Institute study of subchronic (95 - 175 day) effects, depression of body weight was the only effect observed in rats from ingestion of 7000 ppm cyclohexanone, although increased mortality and body weight depression were observed in mice that ingested 50,000 ppm (IRIS 1987).

7.4.3.3 Dermal Absorption

Cyclohexanone is readily absorbed through skin (Aldrich Chemical Co. 1996). Dermal contact produces skin irritation and can be destructive to mucous membranes. In rabbits, 500 mg applied to open skin produced mild redness and edema. However, dermal LD₅₀ was 948 mg/kg (Lewis 1992). The 8 hour TWA for skin exposure to cyclohexanone, as well as the NIOSH exposure limit is 25 ppm (100 mg/m³) (USDHHS 1994a). The limit for occupational contact established by OSHA is 50 ppm. The IDLH for cyclohexanone is 700 ppm (USDHHS 1994a). Eye contact causes severe irritation. In rabbits, 4740 μ g applied to the eye produced severe redness and edema.

7.4.3.4 Inhalation

Cyclohexanone is moderately toxic when inhaled. Inhaled vapors cause respiratory irritation, headache, shortness of breath, and changes in sense of smell (Lewis 1992, USDHHS 1994a). After inhalation of high doses, lungs of mice showed congestion, edema, and hemorrhage (Gupta et al. 1979). In humans, the lowest concentration to cause a toxic effect (TCLo) was 75 ppm, which irritated eyes, nose, and pulmonary system. In rats, LC50 was 8000 ppm (Aldrich Chemical Co. 1996, Lewis 1992). Cyclohexanone may have slight narcotic properties and extreme doses may cause coma (USDHHS 1994a). In extreme cases, death may result from spasm, inflammation, and edema of the larynx and bronchi (Aldrich Chemical Co. 1996).

7.4.3.5 Carcinogenicity/Teratogenicity

Currently, cyclohexanone is not classifiable as a human carcinogen and there is no evidence of teratogenic activity of cyclohexanone (IRIS 1987). In rats, 1430 ppm cyclohexanone ingested during gestation days 9 - 16 caused significant depression of maternal and fetal body weight (IRIS 1987). Cyclohexanone was cytotoxic to cultured mouse cells (Gupta et al. 1979) and human mutation has been reported (Lewis 1992).

7.4.3.6 Wildlife Exposure

No information was available about wildlife exposures to cyclohexane.

7.4.4 Diethyl Malonate

7.4.4.1 Chemical Structure

 $CH_2(COOC_2H_5)_2$

7.4.4.2 Oral Ingestion

Diethyl malonate is mildly toxic by ingestion. Oral LD_{50} for rats and mice is 15 g /kg and 6400 mg/kg, respectively (Lewis 1992).

7.4.4.3 Dermal Absorption

Dermal contact causes skin irritation. Mild irritation resulted when 500 mg diethyl malonate was applied to skin of rabbit (Lewis 1992).

7.4.4.4 Inhalation

No information was available about the inhalation of diethyl malonate.

7.4.4.5 Carcinogenicity/Teratogenicity

No information was available about the carcinogenicity or teratogenicity of diethyl malonate.

7.4.5 Diethyl Phthalate

7.4.5.1 Chemical Structure

 $C_6H_4(CO_2C_2H_5)_2$

7.4.5.2 Oral Ingestion

Diethyl phthalate is moderately toxic by ingestion. Rats fed diets containing 5% diethyl phthalate (approx. 3160 mg/kg/day in males and 3710 mg/kg/day in females) had significantly lower weight gain, and lower absolute weight of heart, brain, liver, spleen, and kidneys (IRIS 1993). However, relative weights of these and other organs were significantly greater in test animals than control animals (Brown et al. 1978). Females fed diets with 1% diethyl phthalate (750 mg/kg/day) also had significantly less weight gain (IRIS 1993).

Chronic intake may cause sluggishness, loss of strength, weight loss, and paralysis of hind quarters (HMIS 1994, J.T. Baker Inc. 1989a). Ingestion of 3250 mg/kg/day of diethyl phthalate by parent rats produced physiological effects in pups (F₁) and significantly decreased number of pups in second-generation litters (F₂). Physiological effects included significant decrease in body weight and increased weight of prostate, liver, and pituitary. The significance of organ weight differences is not fully understood (USDHHS 1993).

The oral NOAEL and LOAEL were established at 750 mg/kg/day and 3160 mg/kg/day, respectively. The lowest reported NOAEL value for diethyl phthalate is 1000 mg/kg/day (USDHHS 1993). The oral RfD is 0.8 mg/kg/day (IRIS 1993). The oral LD₅₀ in rats and guinea pigs is 8600 mg/kg, while the LD₅₀ in mice is 6172 mg/kg (HMIS 1994, J.T. a 1989, Lewis 1992). Ambient water criteria for diethyl phthalate limits intakes through contaminated water and organisms to 350 mg/L, and through organisms alone to 1.8 g/L (EPA 1986).

7.4.5.3 Dermal Absorption

Diethyl phthalate is only slightly irritating when applied to intact or abraded skin. Mild irritation occurred when diethyl phthalate was applied to the eyes of rabbits (USDHHS 1993). A NOAEL of 0.1 mL was established for rabbits (USDHHS 1993). In vitro tests of diethyl phthalate show the chemical is absorbed more quickly through rat skin than human skin.

7.4.5.4 Inhalation

Diethyl phthalate causes irritation when inhaled. Few studies regarding effects from inhalation exposure to humans or animals have been located. The lowest dose of diethyl phthalate vapor to cause an effect in humans was 1000 mg/m³, which caused lachrimation, respiratory obstruction, and other pulmonary effects (Lewis 1992). Other symptoms include CNS depression, coughing, and difficulty breathing (HMIS 1994). The OSHA (PEL) value and the ACGIH (TLV) value is a TWA of 5 mg/m³. No NOAEL values for inhalation were reported in the Toxicological Profile of Diethyl phthalate.

7.4.5.5 Carcinogenicity/Teratogenicity

No information was available about the carcinogenicity or teratogenicity of diethyl phthalate.

7.4.5.6 Wildlife Exposure

Fish, algae, fungi, and bacteria and other microorganisms are able to degrade phthalates to more simple molecules (Woodward 1986). Phthalate esters concentrate in fish tissues, but concentrations decline rapidly when the chemical is removed from water. In two species of minnow under static conditions, there was no observable effect after 96 hours with a concentration of 22 - 30 mg/L diethyl phthalate (Woodward 1986). The LC₅₀ for these minnows was 17 - 30 mg/L. It is unlikely that levels or diethyl phthalate normally present in the environment adversely affect on mammals (Woodward 1986). Accumulation in biota likely is not a hazard to predatory birds (Woodward 1986).

7.4.6 Dimethyl Phthalate

7.4.6.1 Chemical Structure

 $C_6H_4(COOH_3)_2$

7.4.6.2 Oral Ingestion

Dimethyl phthalate is moderately toxic by ingestion. The oral LD₅₀ for rats and mice is 6800 mg/kg, for rabbits 4400 mg/kg, for guinea pigs 2400 mg/kg, and for chickens 8500 mg/kg (Aldrich Chemical Co. 1995b, Lewis 1992). The oral NOEL reported by IRIS was 1000 mg/kg/day based upon chronic study of rats showing effects to kidneys. Symptoms of exposure may include burning sensation, coughing, wheezing, laryngitis, headache, nausea, and vomiting (Aldrich Chemical Co. 1995b). Intake of dimethyl phthalate may cause CNS depression (Aldrich Chemical Co. 1995b, J.T. Baker Inc. 1992a). The subchronic RfD is 100 mg/kg/day (EPA 1993). Ambient water criteria for dimethyl phthalate limits intakes through contaminated water and organisms to 313 mg/L, and through organisms alone to 2.9 g/L (EPA 1986).

7.4.6.3 Dermal Absorption

Dimethyl phthalate causes irritation when applied to eyes (Lewis 1992, USDHHS 1994). The LD_{50} for dermal exposure to dimethyl phthalate in rats, rabbits, and guinea pigs is > 4800 mg/kg, > 20 mL/kg, and > 10 mL/kg, respectively (Aldrich Chemical Co. 1995b).

7.4.6.4 Inhalation

Dimethyl phthalate is mildly toxic by inhalation. The LCLo, established in cats, was 930

mg/m³/6 hours (Lewis 1992). Symptoms may include irritation of upper respiratory system and

mucous membranes (Aldrich Chemical Co. 1995b, J.T. Baker Inc. 1992a, USDHHS 1994).

Occupational exposure limits reported by OSHA (PEL) and ACGIH (TLV) are TWA of 5 mg/m³.

The IDLH is 2000 mg/m³ (USDHHS 1994). No information regarding inhalation of dimethyl

phthalate was available from IRIS.

7.4.6.5 Carcinogenicity/Teratogenicity

Dimethyl phthalate caused mutagenic effects in vitro bioassays (IRIS 1993). It may be

toxic to embryos and affect development of fetal eye, ear, and musculoskeletal tissues (Aldrich

Chemical Co. 1995b).

7.4.6.6 Wildlife Exposure

No information regarding wildlife exposures to dimethyl phthalate is available.

7.4.7 Ethyl Phthalate

7.4.7.1 Chemical Structure

 $C_6H_4(CO_2CH_2CH_3)_2$

7.4.7.2 Oral Ingestion

Ethyl phthalate is moderately toxic by ingestion (IRIS 1993) (see diethyl phthalate).

7.4.7.3 Dermal Absorption

Ethyl phthalate is only slightly irritating when applied to intact or abraded skin (see

diethyl phthalate) (USDHHS 1993).

7.4.7.4 Inhalation

Ethyl phthalate causes irritation when inhaled (Lewis 1992). Few studies regarding

effects from inhalation exposure to humans or animals are available (see diethyl phthalate).

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7.4.7.5 Carcinogenicity/Teratogenicity

Ethyl phthalate caused mutagenic effects in vitro bioassays (IRIS 1993).

7.4.7.6 Wildlife Exposure

No information regarding wildlife exposures to ethyl phthalate is available.

7.4.8 Eucalyptol

7.4.8.1 Chemical Structure

C₁₀H₁₈O

7.4.8.2 Oral Ingestion

Eucalyptus oil, containing chiefly eucalyptol, is a human poison when ingested in large amounts. In a human child, 218 mg/kg caused ciliary eye spasms, respiratory depression, and somnolence. In an adult human, 375 mg/kg was lethal. The LD₅₀ in rats is 2480 mg/kg (Lewis 1992). Ingestion of non-toxic amounts of eucalyptol, along with other terpenes, has been shown to reduce activity of hepatic coenzymes, which may inhibit formation of gallstones (Clegg et al. 1980).

7.4.8.3 Dermal Absorption

Eucalyptus oil caused moderate skin irritation when applied to rabbits (Lewis 1992).

7.4.8.4 Inhalation

No information regarding inhalation of eucalyptol is available.

7.4.8.5 Carcinogenicity/Teratogenicity

No information was available regarding the carcinogenicity of eucalyptol. Eucalyptol is able to pass through the placenta; to the fetus, eucalyptol may stimulate liver microsomal activity (Jori and Briatico 1973). Eucalyptol is not able to cross the blood-milk barrier from mother to nursing young (Jori and Briatico 1973).

7.4.8.6 Wildlife Exposure

No information regarding wildlife exposures to eucalyptol is available.

7.4.9 Methyl Salicylate

7.4.9.1 Chemical Structure

C₈H₈O₃

7.4.9.2 Oral Ingestion

Methyl salicylate is recognized as a safe food additive by the FDA (Bennett et al. 1984). Chemical exposure via ingestion poses the biggest threat to humans and animals. Effects include dyspnea, nausea, vomiting, and excitation of the CNS (J.T. Baker 1989b, Lewis 1992, Opdyke 1979). Oral administration of 700 mg/kg in dogs decreased cardiac output and increased heart rate (Opdyke 1979). Large doses (> 600 mg/kg) affected the CNS and respiratory function. In rats the oral LD₅₀ is 887 mg/kg and the oral TDLo is 36,450 mg/kg (Lewis 1992). Human ingestion of small doses (30 mL for adults) may cause death (Bennett et al. 1984, Lewis 1992, Opdyke 1979).

Chronic intake of methyl salicylate may cause damage to liver, kidneys, and blood (J.T. Baker Inc. 1989b). One study showed ingestion of methyl salicylate as 1% - 2% of the diet for two years caused significant decrease in body weight and may change bone composition. The highest dose caused death in 50 days (Opdyke 1979). Dogs receiving > 500 mg/kg/day decreased in body weight and died by day 59. In rats, two years' consumption of 0.21% methyl salicylate in the diet caused no adverse effects (Opdyke 1979).

7.4.9.3 Dermal Absorption

Dermal application of methyl salicylate can cause skin and eye irritation and repeated application has been known to cause kidney damage among laboratory animals (HMIS 1994). The acute dermal LD_{50} in rabbits exceeds 5 g/kg (Opdyke 1979). In rabbits, 500 mg applied to skin caused moderate redness and edema and the same amount applied to eyes caused mild to severe redness (Lewis 1992).

7.4.9.4 Inhalation

Rats exposed 20 times to 700 mg/m³ methyl salicylate for 7 hours caused no toxic

symptoms or pathologic abnormalities (Opdyke 1979).

7.4.9.5 Carcinogenicity/Teratogenicity

Methyl salicylate is not known to be carcinogenic (Opdyke 1979, HMIS 1994). Injection

of 0.1 mL methyl salicylate to female rats in day 10 and 11 of pregnancy decreased weight

gain of the mother, decreased number and weight of young, increased number of malformed

young and resorptions, and retarded renal development in rat fetuses (Opdyke 1979). Up to

5000 ppm methyl salicylate administered to rats for 3 generations did not decrease fertility, but

3000 - 5000 ppm doses decreased litter size, survival, and numbers of live-born progeny

(Opdyke 1979). In a separate study, effects to offspring were observed in rats ingesting

36,540 mg/kg methyl salicylate (Bennett et al. 1984).

7.4.10 Sodium Carbonate (a Chemical Constituent of Soman, PCAS)

7.4.10.1 Chemical Structure

CO₃·2Na

7.4.10.2 Oral Ingestion

Sodium carbonate is moderately toxic by ingestion with a rat oral LD₅₀ of 4090 mg/kg

(Lewis 1992). Ingestion of large quantities may corrode the GI tract, and cause vomiting and

diarrhea (HSDB 1987).

7.4.10.3 Dermal Absorption

Sodium carbonate is a mild skin and eye irritant (HSDB 1987, Lewis 1992). An

aqueous solution of 50% weight/volume sodium carbonate applied to abraded and intact skins

of rabbits and guinea pigs caused little or no redness or swelling after 48 hours (HSDB 1987).

7.4.10.4 Inhalation

Sodium carbonate is moderately toxic with a LC_{50} of 2300 mg/m³/2 hours (Lewis 1992). Rats exposed to an aerosol of 2% aqueous solution of sodium carbonate for 4 hours/day, 5 days/week for 3.5 months had reduced weight gain and lung damage (HSDB 1987).

7.4.10.5 Carcinogenicity/Teratogenicity

No information is available regarding carcinogenic or teratogenic effects.

7.4.11 Polyethylene oxide (a Chemical Constituent of Soman, PCAS)

7.4.11.1 Chemical Structure

Chain of ethylene oxide [CH2CH2O]nH

7.4.11.2 Oral Ingestion

Ethylene oxide is a poison by ingestion (Lewis 1992).

7.4.11.3 Dermal Absorption

Ethylene oxide is an irritant to skin and eyes as well as mucous membranes of the respiratory tract.

7.4.11.4 Inhalation

Ethylene oxide is moderately toxic by inhalation with a rat LC_{50} of 800 ppm/4 hours. Human systemic effects by inhalation include convulsions, nausea, vomiting, and olfactory and pulmonary changes (Lewis 1992). High concentrations can cause pulmonary edema (Lewis 1992).

7.4.11.5 Carcinogenicity/Teratogenicity

Ethylene oxide is a confirmed human carcinogen with experimental carcinogenic, tumerigenic, neoplastigenic, and teratogenic study results (Lewis 1992).

7.4.11.6 Wildlife Exposure

Information on wildlife exposures to ethylene oxide is not available.

7.4.12 Hydroxyethylcellulose (a Chemical Constituent of Soman, PCAS)

7.4.12.1 Chemical Structure

 $[C_6H_7O_2(OH)_3]_n$

7.4.12.2 Oral Ingestion

The greatest danger from ingestion of large quantities is intestinal obstruction. Toxic doses by ingestion are in excess of 2 g/kg. Groups of rats maintained for 2 years on diets containing 5%, 1%, and 0.2% hydroxyethylcellulose did not exhibit adverse effects to growth, food intake, life-span, frequency of extraneous infections, body measurements, kidney and liver weights, hematologic exam, occurrence of neoplasms, or histologic exams of organs. It has been administered to rats in single oral doses as high as 23,000 mg/kg with no toxic effects (HSDB 1987).

7.4.12.3 Dermal Absorption

Skin sensitization is unusual (HSDB 1987).

7.4.12.4 Inhalation

Inhalation could cause chemical pneumonitis.

7.4.12.5 Carcinogenicity/Teratogenicity

Hydroxyethylcellulose is not a risk to human or animal health. It is not toxic or carcinogenic (Scientific Polymer Products Inc. 1994).

7.4.13 Glycerol (a Chemical Constituent of Soman, PCAS)

7.4.13.1 Chemical Structure

C₃H₅(OH)₃

7.4.13.2 Oral Ingestion

Glycerol has low oral toxicity in humans (IRIS). Very high concentrations may cause damage to kidneys and red blood cells (IRIS). Toxic effects including headache, nausea, and vomiting occurred in an adult human after ingestion of 1428 mg/kg glycerol (Lewis 1992, HMIS 1994). The oral LD $_{50}$ in mice and guinea pigs is 4090 mg/kg and 7750 mg/kg, respectively (Lewis 1992). The oral LD $_{50}$ in rats is 12,600 mg/kg (HMIS 1994). Chronic ingestion may cause damage to kidneys (HMIS 1994).

7.4.13.3 Dermal Absorption

Glycerol has a low irritant potential to human skin and eyes (IRIS). Glycerol application caused sensitization in a few individuals (IRIS, HMIS 1994). Application of 500 mg/24 hours caused mild redness and edema in rabbits (Lewis 1992). Contact of 500 mg/24 hours with rabbit eyes caused mild of irritation (Lewis 1992).

7.4.13.4 Inhalation

In humans, glycerol is a nuisance particle and an inhalation irritant (Lewis 1992). Occupational exposure limits established for glycerol mist by OSHA (PEL) and ACGIH (TLV) are TWA 10 mg/m³ (Lewis 1992).

7.4.13.5 Carcinogenicity/Teratogenicity

Human mutation data have been reported (Lewis 1992). However, there is no evidence of carcinogenicity in long-term oral and dermal absorption studies of rats (IRIS). Most tests for mutagenicity were negative (IRIS).

No information regarding wildlife exposure to glycerol is available.

7.4.14 Diethyl Malonate (a Chemical Constituent of Soman, PCAS)

Please refer to section 7.4.4 for information regarding diethyl malonate.

7.4.15 Ferrous Ammonium Sulfate (a Chemical Constituent of Mustard Lewisite, PCAS)

7.4.15.1 Chemical Structure

No chemical structure of ferrous ammonium sulfate is available.

7.4.15.2 Oral Ingestion

Ferrous ammonium sulfate is poorly absorbed from the gastrointestinal tract. Ingestion causes irritation of the mouth and stomach (HSDB 1995). Ingestion of large amounts of ammonium salts is toxic and may cause abdominal pain, diarrhea, vomiting, lassitude, hyperventilation, corrosion of the stomach, and cardiovascular collapse (HSDB 1995). The lethal dose is related to iron content; as little as 1 - 2 g of iron may cause death. In rats, the LD₅₀ is 0.5 - 5 g/kg (HSDB 1995).

7.4.15.3 Dermal Absorption

Dust can irritate skin and eyes with prolonged contact (HSDB 1995).

7.4.15.4 Inhalation

Inhalation of dust irritates the nose and throat. The exposure standard recommended by OSHA is an 8 hour TWA of 1 mg/m³ (HSDB 1995).

7.4.15.5 Carcinogenicity/Teratogenicity

No information was found about carcinogenicity or teratogenicity. Iron is known to cross the placenta and may concentrate in the fetus (HSDB 1995).

7.4.15.6 Wildlife Exposure

No information regarding wildlife exposure to ferrous ammonium sulfate is available.

7.4.16 Polyethylene oxide (a Chemical Constituent of Mustard Lewisite, PCAS)

Please refer to section 7.4.11 for information regarding polyethylene oxide.

7.4.17 Hydroxyethylcellulose (a Chemical Constituent of Mustard Lewisite, PCAS)

Please refer to section 7.4.12 for information regarding hydroxyethylcellulose.

7.4.18 Glycerol (a Chemical Constituent of Mustard Lewisite, PCAS)

Please refer to section 7.4.13 for information regarding glycerol.

7.4.19 Methyl salicylate (a Chemical Constituent of Mustard Lewisite, PCAS)

Please refer to section 7.4.9 for information regarding methyl salicylate.

7.4.20 2,2 Dipyridyl (a Chemical Constituent of CADS, PCAS)

7.4.20.1 Chemical Structure

C₁₀H₈N₂

7.4.20.2 Oral Ingestion

Dipyridyl administered orally to rats caused tremors and slight ptosis that completely disappeared in 24 hours (HSDB 1995).

7.4.20.3 Dermal Absorption

Dipyridyl caused conjunctivitis and alopecia with dermal contact (HSDB 1995).

7.4.20.4 Inhalation

No information regarding inhalation of 2,2 dipyridyl is available.

7.4.20.5 Carcinogenicity/Teratogenicity

Genotoxic effects to mammalian cells have been shown in *in vitro* assays. Effects included damage to DNA and mutagenic effects (Kuo and Lin 1993). When rats were given a single dose of 60 or 75 mg/kg, fetuses were low in weight and had limb defects (Oohira and Nogami 1978).

7.4.20.6 Wildlife Exposure

No information regarding wildlife exposure to 2,2 dipyridyl is available.

7.4.21 Phenolphthalein (a Chemical Constituent of CADS, PCAS)

7.4.21.1 Chemical Structure

C20H14O4

7.4.21.2 Oral Ingestion

Phenolphthalein is most commonly absorbed into the body by ingestion. In humans, it is toxic only via intraperitoneal exposure (Lewis 1992). In a 13-week experiment with rats, exposure to phenolphthalein, at doses much higher than normally encountered, produced little evidence of toxicity in rats (Dietz et al. 1992). However, elevated liver and kidney weights did occur. Reproductive changes also resulted. Side effects included depressed testis and sperm densities, increases in abnormal sperm production, and morphological changes in seminiferous tubules (Dietz et al. 1992). Changes occurred between exposure quantities of 3000 ppm to 50,000 ppm (Dietz et al. 1992). In rats the peritoneal LDLo is 500 mg/kg (Lewis 1992).

7.4.21.3 Dermal Absorption

Exposure to phenolphthalein caused edema of eyelids and accompanying reactions of the skin, some of which were severe (HSDB 1995).

7.4.21.4 Inhalation

Phenolphthalein can also create a health risk to humans and animals during thermal decomposition. Thermal decomposition emits acrid smoke and irritating fumes (Dietz et al. 1992, Lewis 1992).

7.4.21.5 Carcinogenicity/Teratogenicity

No data were found regarding the carcinogenic effects of phenolphthalein exposure. However, experiments, data, and information reviewed did not mention carcinogenic effects.

Teratogenic effects are limited to a few reproductive side effects. Phenolphthalein fed to mice for 3 generations failed to produce teratogenesis (HSDB 1995). Ingestion of phenolphthalein by pregnant mice caused significant reduction in fertility and number of litters (Gulati et al. 1991).

7.4.21.6 Wildlife Exposure

No information regarding wildlife exposure to phenolphthalein is available.

7.4.22 Isopropanol (a Chemical Constituent of CADS, PCAS)

7.4.22.1 Chemical Structure

(CH₃)₂CHOH

7.4.22.2 Oral Ingestion

Ingestion of isopropyl alcohol in humans may produce gastrointestinal pain, cramps, nausea, and vomiting. Extreme concentrations result in coma, shock, respiratory failure, and death (J.T. Baker Inc. 1990, Lewis 1992, NIOSH 1976, HMIS 1994). Small doses (2.6 mg/kg to 6.4 mg/kg) produced no adverse effects among adult human males. In juvenile rats, the oral LD₅₀ is 5.6 mL/kg; in adult rats the oral LD₅₀ is 6.8 - 6.0 mL/kg (HMIS 1994, NIOSH 1976). The oral LD₅₀ reported for rabbits is 10.2 mL/kg (HMIS 1994).

7.4.22.3 Dermal Absorption

Isopropyl alcohol is not a strong dermal irritant and rarely causes contact dermatitis. Acute dermal LD₅₀ in rabbits was 16.4 mL/kg (NIOSH 1976). Isopropyl alcohol failed to produce adverse effects when applied dermally to guinea pigs, dogs, and white rats (no dosage given) (NIOSH 1976). Contact with eyes may cause damage and severe corneal burns (HMIS 1994).

7.4.22.4 Inhalation

Isopropyl alcohol vapors may cause irritation of eyes, nose, and throat. Inhalation of high concentrations causes narcosis (J.T. Baker Inc. 1990, Lewis 1992, NIOSH 1976, HMIS 1994). In rats, the maximum average daily concentration of isopropyl alcohol that caused no

adverse effects was 0.6 mg/m³ (0.24 ppm; NIOSH 1976). Rats that inhaled more than 1 ppm continuously for 86 days exhibited slowed reaction times, significant changes in blood chemistry, and cellular damage of the spleen, liver, and cerebral motor neurons (NIOSH 1976). Exposure limits established by OSHA and NIOSH are 400 ppm (980 mg/m³) and 500 ppm for short term exposure. The IDLH is 2000 mg/m³ (USDHHS 1994a).

7.4.22.5 Carcinogenicity/Teratogenicity

There is no evidence isopropyl alcohol is carcinogenic (HMIS 1994, NIOSH 1976, Lewis 1992). Currently, no data concerning teratogenicity of ingested or inhaled isopropyl alcohol are available.

7.5 NON SPECIFIC SIMULANTS

7.5.1 Titanium Dioxide (Hand Grenade Smoke Simulating Brass Obscurant)

7.5.1.1 Chemical Structure

TiO₂

7.5.1.2 Oral Ingestion

Generally, titanium compounds (specifically titanium dioxide) are considered physiologically inert, and are not toxic by ingestion (Lewis 1992). Titanium is not absorbed from the gastrointestinal tract by blood (HSDB 1995). In rats fed titanium coated mica as 1% - 5% of the diet for up to 130 weeks, there was no evidence of a toxicological effect (HSDB 1995).

7.5.1.3 Dermal Absorption

Titanium dioxide is not known to produce contact dermatitis or allergic sensitization, but it may be irritating to human skin (HSDB 1995, Lewis 1992).

7.5.1.4 Inhalation

Titanium dioxide is a nuisance dust (HSDB 1995). It is a mild pulmonary irritant and may be responsible for episodes of bronchitis and lung damage in industrial situations (HSDB

1995). Most inhaled titanium dioxide is biologically inert (HSDB 1995). Rats that inhaled 10, 50, or 250 mg/m³ titanium dioxide for 6 hours/day, 5 days/week, for 104 weeks had no significant effects to tissues, weight gain, or survival (HSDB 1995). Lung tumors were found in rats exposed to 250 mg/m³ for 24 months (HSDB 1995). In a separate study with identical exposure criteria, rats exposed to 250 mg/m³ had marked increase in weight of lungs and lung macrophages. After two years' exposure, some lung cancers were observed (HSDB 1995).

7.5.1.5 Carcinogenicity/Teratogenicity

Titanium dioxide is not classifiable as to carcinogenicity in humans (HSDB 1995). There are experimental carcinogenic, tumerogenic, and neoplastinogenic data for titanium dioxide (Lewis 1992). In rats fed titanium coated mica as 1% - 5% of the diet for up to 130 weeks, there was no evidence of carcinogenic effects (HSDB 1995).

7.5.1.6 Wildlife Exposure

There were no apparent toxic effects in *Daphnia magna* that were exposed to 1000 mg/L titanium dioxide (Haley and Kurnas 1993).

7.5.2 PEG 200-Polyethylene glycol

7.5.2.1 Chemical Structure

 $(-CH_2CH_2O-)_n$, where $n \ge 4$. In general, each PEG is followed by a number indicating its general molecular weight, (200 in this case)

7.5.2.2 Oral Ingestion

Polyethylene glycol (PEG) is practically non-toxic, however low molecular weight PEGs have the most toxic effects (HSDB 1995). Polyethylene glycols caused no adverse effects in dogs when fed for one year at 2% of their diet (HSDB 1995). PEG is classified as safe for use in food. The oral LD $_{50}$ in rats and mice was 28,900 mg/kg and 38,300 mg/kg, respectively. The oral LD $_{50}$ for rabbits and guinea pigs is 19.9 g/kg and 17 g/kg, respectively (Dickie 1979). Rats that ingested 16 g/kg/day of PEG in drinking water for 15 days had severe kidney abnormalities (Dickie 1979). Some rats ingesting PEG 200 at 8 - 20 g/kg/day for 80 - 90 days

died of liver and kidney abnormalities, but survivors in these studies had nearly normal organs (Dickie 1979). A dose of 5 g/kg/day for 90 days in drinking water caused no effects to rats.

7.5.2.3. Dermal Absorption

No toxic effects caused by dermal contact have been documented. Application of 2 mL/kg PEG on rabbit skin caused no deaths. Administration of 0.1 mL to the rabbit eye caused no irritation. Application of 50% PEG on human skin caused no irritation to diseased or normal skin (HSDB 1995).

7.5.2.4 Inhalation

No TWA or TLV values have been established for polyethylene glycol. Inhalation of this compound does not present a significant exposure because of extremely low vapor pressure. In mice and rats, acute inhalation of 2516 mg/m³ (6 hours) caused no deaths or "biologically sufficient" effects. Chronic inhalation of 1000 mg/m³ (13 weeks) caused no deaths or "biologically sufficient" effects.

7.5.2.5 Carcinogenicity/Teratogenicity

No carcinogenic effects have been documented in relation to PEG 200. There were no teratogenic effects in pregnant rats fed doses of 10 gm/kg/day of PEG for 10 days. Other studies confirmed these results (HSDB 1995). However, teratogenic activity of PEG 200 in mice has been demonstrated in laboratory tests, and the occurrence of severe facial malformations has been reported (HSDB 1995). Another study reported abnormal brain development as the main effect in mice. Polyethylene glycol 200 proved embryolethal at 0.5% and 0.75% in rats, hamsters, rabbits, and humans. The concentration of PEG 200 at 1% is embryolethal (HSDB 1995).

7.6 SELECTION OF TOXICITY VALUES

Toxicity values were selected from Table 10, which identifies toxicity values for each chemical stressor evaluated in the ERA. We derived toxicity values when specific values were not available for Indiana bats, gray bats, and bald eagles.

Several methods exist to establish a toxicity value. A value for the species in the same taxonomic family (preferentially) is used to estimate a toxicity value for the species of concern. This approach is considered scientifically justified (California Dept. of Toxic Substances Control 1994). Species chosen from which to develop toxicity data are termed surrogate species. Selection of appropriate toxicity values, based on a balance of taxonomic and physiological similarity, quality of data, and expected mode of toxic action is recommended by the State of California Department of Toxic Substances Control (1994). Toxicity values of surrogate species can be used to estimate toxicity values for the representative species. Data from surrogate species could be used to estimate the NOAEL in the representative species. The NOAEL (surrogate) may be adjusted by dividing by uncertainty factors (UF) to determine a relative value for the species of concern. UFs are commonly applied to animal toxicity data values to establish human toxicity values. RfD's, as described earlier, are established by this method. RfD's are not available for animals.

We developed toxicity values for Indiana bats, gray bats, and bald eagles by two methods. We developed a model (BATS.XLS) for the Ongoing Mission BA (3D/Environmental 1996b) employing allometric equations to extrapolate toxicity values from common test species (e.g. rats, guinea pigs, and mice) to toxicity values for Indiana bats and gray bats. BATS.XLS compares weights and body size of the test species (surrogate) and species of concern. This method assumes the species of concern is as sensitive to the stressor as the surrogate species. We used the calculated NOAEL for inhalation and ingestion (NOAELair and NOAELfood) of Indiana bats and gray bats for terephthalic acid (refer to Ongoing Mission BA for more details about this model) because we could not find NOAEL values for most of the stressors. This method does not account for significant differences in anatomy or physiology. BATS.XLS was created to provide modeled toxicity values for Indiana bats and gray bats. We did not include information to extrapolate bald eagle toxicity values. Avian toxicity values were not readily available.

We established a TRV for TPA for bald eagles. We used the same decision process for the development of Toxicity Reference Values (TRVs) for Indiana bats and gray bats for all stressors except TPA. TRV's were developed by selecting toxicity values from Table 10 for the chemical stressors. Next, we applied uncertainty factors presented in Wentsel et al. (1994). Table 11 provides the "critical study" for each toxicity value. Figure 10 is the decision tree with

UFs indicated. UFs are multiplicative and are used to express degrees of uncertainty. The toxicity value (i.e. NOAEL or LD_{50}) is divided by the appropriate UFs.

We used a hierarchy for selection of toxicity values. Toxicity values were selected in the following order chronic NOAEL, chronic LOAEL, acute NOAEL, acute LOAEL, LD50 or LC50, PEL, and TLV. Table 11 presents the toxicity values selected with appropriate UFs (Figure 10) for the TRV. TRVs were calculated for bats (both species) and bald eagles. Indiana and gray bats were not treated differently in this method because they belong to the same genera. BATS.XLS treats these two species differently due to different body weights and sizes.

We established one dermal TRV for fog oil. It was the only dermal toxicity value identified in the toxicity assessment. We did not determine if UFs (established by Wentsel et al. 1994) we applied account for differences in dermal toxicity between surrogate species and species of concern. Without establishing another UF, we chose to use the same UFs as ingestion and inhalation. This assumes the toxic responses expressed by a rat would be similar to those in bats and birds. UFs applied would account for some differences in sensitivity.

TABLE 10. Toxicity values of chemical gathered during the literature search. Values used in the ERA are shaded.

	Value and Course
Chemical	Value and Source
Fog Oil (acute)	(Shinn et al. 1987)
LC50 acute rat ihl	60000 mg/m3
Diesel Fuel	(Shinn et al. 1987)
LC50 rat ihl	26000 mg/m3
Fog Oil	(Selgrade et al. 1990)
LC50 rat ihl	2.0 mg/l
SGF-2 aerosols	(Driver et al. 1992)
LC50 acute ihl rat	5200 mg/m3
Old Fog Oil (acute)	(Driver et al. 1992)
Dermal LD50 rat	>2g/kg (effect at dose was slight skin irritation = LOAEL)
Oral LD50 rat	>5g/kg
Paraffinic lube oil (acute)	(Driver et al. 1992)
Dermal LD50 rat	>2g/kg (effect at dose was slight skin irritation = LOAEL)
Oral LD50 rat	>5g/kg
Napthenic Fog Oil (acute)	(Driver et al. 1992)
Dermal LD50 rat	>2g/kg (effect at dose was slight skin irritation = LOAEL)
Oral LD50 rat	>5g/kg
Fog Oil	(Driver et al. 1992)
ACGIH TWA	5 mg/m3
ACGIH STEL	10 mg/m3
Fog Oil	(Palmer et al. 1992)
Chronic LOAEL	100 mg/m3
Fog Oil	(Driver et al. 1992)
NOAEL (animal study)	5 mg/m3
Light Mineral Oil	(Driver et al. 1992)
NOAEL dog,rat,mus,rbt,ham	
LOAEL dog,rat,mus,rbt,ham	
Light Mineral Oil	(Lewis 1989)
LD ₅₀ mus, orl, chronic	22 g/kg
TD₀ rat, dermal, acute	216 g/kg
Mineral Oil	(Bramachari 1958)
LOAEL rat, orl, acute	17.6 g/kg
Old Fog Oil	(Driver et al. 1992)
LOAEL rat	200 mg/m3
Auto Lube Oil	(Driver et al. 1992)
LOAEL mouse	(D 1 . 1 . 4000)
Diesel Fuel	(Driver et al. 1992)
LD50 rat	16.0 ml/kg
Aromatic distillate	(Driver et al. 1992)
LD50 rat	4600 mg/m3 (7 hours)
Torombabalia Asid	(EDA 1082)
Terephthalic Acid	(EPA 1982)
LD50 mice ipl	1900 mg/kg 3200 mg/kg
LD100 mice ipl	2mg/kg/min
LD100 dogs inv	Zing/ng/min

Chemical	Value and Source
TPA	(ACGIH 1995)
TWA Human	10 mg/m ³
Bacillus subtillus (bpn)	(Lewis 1992)
LD50 ipr mus	75 mg/kg
Bacillus subtillus (carlsburg)	(Lewis 1992)
LD50 ori rat	3700 mg/kg
M2 Coliphage	Non-toxic
Erwinia herbicola	Non-toxic
Elwina nerbicola	NOTIFICALC
Ovalbumin	Non-toxic
Kaolin dust	(HMIS 1994)
OSHA PEL	10 mg/m3
ACGIH TLV	2 mg/m3
Kaolin dust	(Lewis 1992)
orl rat TDIo	590 g/kg
Anisole	(Lewis 1992)
skn rbt	500 mg (24 hours MOD)
orl rat LD50	3700 mg/kg 2800 mg/kg
orl mus LD50 Anisole	(Opdyke 1974)
Acute oral LD50 mus	2800 mg/kg
Acute oral LD50 rat	3700 mg/kg
Anisole	(Aldrich 1995)
orl rat LD50	3700 mg/kg
ihl rat LC50	>5000 mg/m3
orl mus LD50	2800 mg/kg
ihl mus LC50	3021 mg/m3/2H
Anisole	(Taylor 1964)
LD50 rat	3700 mg/kg
Benzaldehyde	IRIS 1995
NOEL	200 mg/kg/day converted to 143 mg/kg/day
LOAEL	400 mg/kg/day
RfD	1E-1 mg/kg/day
Benzaldehyde	(Lewis 1992)
skn rbt	500 mg (24 hours MOD)
orl rat LD50	1300 mg/kg
scu rat LDIo	5000 mg/kg
orl mus LD50	28 mg/kg
ipr mus LD50 scu rbt LD50	9 mg/kg 5000 mg/kg
orl gpg LD50	1000 mg/kg
Benzaldehyde	(Kluwe et a. 1983)
NOEL rat	400 mg/kg/day
NOEL Male Mouse	300 mg/kg/day
NOEL Female Mouse	600 - 1200 mg/kg/day
Benzaldehyde	(HMIS 1994)
orl rat LD50	1300 mg/kg

Chemical	Value and Source
Benzaldehyde	(Aldrich Chemical Company 1995)
orl rat LD50	1300 mg/kg
orl mus LD50	28 mg/kg
ipr mus LD50	9 mg/kg
ocu rbt LD50	5 gm/kg
orl gpg LD50	1 gm/kg
ori mam LD50	2020 mg/kg
Ovelehovenene	(IRIS 1995)
Cyclohexanone	3300 ppm (462 mg/kg/day)
NOAEL LOAEL	6500 ppm(910 mg/kg/day)
RfDo	5E+0 mg/kg/day
Cyclohexanone	(Lijinsky and Kovatch 1986)
orl rat LD50	1.6 g/kg
orl mus LD50	2.1 g/kg
Cyclohexanone	(Lewis 1992)
orl rat LD50	1535 mg/kg
inhl rat LC50	8000 ppm (4 hours)
scu rat LD50	2170 mg/kg
orl mus LD50	1400 mg/kg
ipr mus LD50	1350 mg/kg
sku mus LDlo	1300 mg/kg
ivn dog LDlo	630 mg/kg
orl rbt LDlo	1600 mg/kg
skn rbt LD50	948 mg/kg
Cyclohexanone	(HMIS 1994)
OSHA PEL	S, 50 ppm
ACGIH TLV	S, 100ppm (Skin) STEL
LD50 orl rat	1620 mg/kg
Cyclohexanone	(Aldrich Chemical Company
orl rat LD50	1620 ul/kg
ihl rat LC50	8000 ppm/4h
ipr rat LD50	1130 mg/kg
scu rat LD50	2170 mg/kg
orl mus LD50	1400 mg/kg
ipr mus LD50	1230 mg/kg
skn rbt LD50	1 ml/kg
ipr rbt LD50	1540 mg/kg
orl mam LD50	3 gm/kg
ihl mam LC50	25 gm/m3
Cyclohexanone	(Gupta et al. 1979)
ipl mus LD50	1.23 g/kg 2.07 g/kg
orl mus LD50 m orl mus LD50 f	2.11 g/kg
ipl rat LD50	1.13 g/kg
orl rat LD50 m	1.8 g/kg
orl rat LD50 ff	1.8 g/kg
ipl rbt LDd50	1.54 g/kg
ipl gpg LD50	0.93 g/kg
Diethyl malonate	(Aldrich Chemical Company 1995)
LD50 rat orl	1500 mg/kg
LD50 mus orl	6400 mg/kg

Chemical	Value and Source
LD50 rbt skn	500 mg/24hr
LD50 gpg skn	10 ml/kg
Diethyl malonate	(Bennett et al. 1984)
LD50 orl rat	1500 mg/kg
LD50 orl mus	6400 mg/kg
Diothyl obtholoto	(IRIS1995)
Diethyl phthalate NOAEL	1% of diet (750 mg/kg bw/day)
LOAEL	5% of diet (3160 mg/kg bw/day)
RfD	8E-1 mg/kg/day
Diethyl phthalate	(J T Baker Inc. 1989a)
ori rat LD50	6800 mg/kg
OSHA PEL	5 mg/m3
ACGIH TLV	5 mg/m3
Diethyl phthalate	(Lewis 1992)
orl rat LD50	8600 mg/kg
ipr rat LD50	5058 mg/kg
orl mus LD50	6172 mg/kg
ipr mus LD50	2749 mg/kg 8600 mg/kg
orl gpg LD50 Diethyl phthalate	Toxicological Profile for Diethyl Phthalate
LD50 rat	8 g/kg
Diethyl phthalate	(HMIS 1994)
LD50 orl rat	8600 mg/kg
LC50 ihi rat	7510 mg/m3
LD50 ipl rat	5058 mg/kg
LD50 orl mus	6172 mg/kg
Diethyl phthalate	
LD50 orl rat	9000 mg/kg
Diethyl phthalate	(Woodward 1986)
LD50 rat	7 g/kg
Diethyl phthalate LD50 orl rat	(Bennett et al. 1984) 9000 mg/kg
LD50 off mus	6172 mg/kg
LDIo orl rbt	1000 mg/kg
TClo ihl hum	1000 mg/m3
LC50 ihl rat	7510 mg/m3
LC50 ihl mus	4890 mg/m3
LC50 ihl mam	8240 mg/m3
	044 1 14000
Dimethyl phthalate	(Woodward 1986)
LD50 rat LD50 bird	7 g/kg 100 mg/kg
Dimethyl phthalate	100 mg/kg (Woodward 1986)
LD50 rat	8 g/kg
Dimethyl phthalate	(HMIS 1994)
LD50 orl rat	6800 mg/kg
LD50 skn rat	>4800 mg/kg
LD50 ipr rat	3375 ul/kg
LD50 unr rat	9500 mg/kg
LD50 orl mus	6800 mg/kg
LD50 ipr mus	1380 mg/kg
LD50 unr mus	6800 mg/kg

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Chemical	Value and Source
LD50 orl rbt	4400 mg/kg
LD50 of 15t	>20 ml/kg
LD50 orl gpg	2400 mg/kg
LD50 on gpg LD50 skn gpg	>10 gm/kg
LD50 unr gpg	4800 mg/kg
LD50 upl ckn	8500 mg/kg
Dimethyl phthalate	(HMIS 1994)
LD50 orl rat	9000 mg/kg
Dimethyl phthalate	(Lewis 1992)
orl rat LD50	6800 mg/kg
ipr rat LD50	3375 mg/kg
orl mus LD50	6800 mg/kg
ipr mus LD50	1380 mg/kg
orl rbt LD50	4400 mg/kg
orl gpg LD50	2400 mg/kg
orl ckn LD50	8500 mg/kg
OSHA PEL	TWA 5mg/m3
ACGIH TLV	TWA 5mg/m3
Cthul abthalata	(Lewis 1992)
Ethyl phthalate LD50 orl rat	8600 mg/kg
LD50 on rat	5058 mg/kg
LD50 ipi fat LD50 orl mus	6172 mg/kg
LD50 or mus	2749 mg/kg
LD50 orl gpg	8600 mg/kg
Ethyl phthalate	(HMIS 1994)
OSHA TWA	5 mg/m3
ACGIH TWA	5 mg/m3
NIOSH TWA (10 hour)	5 mg/m3
TCIo ihl hum	1000 mg/m3
LD50 skn gpg	>20 ml/kg
LD50 orl rat	8600 mg/kg
LD50 orl mus	6172 mg/kg
LD50 orl rbt	1gm/kg
LD50 orl gpg	8600 mg/kg 44240 mg/kg
TDIo 14 day orl rat TDIo 6 weeks orl rat	133 gm/kg
TDio 16 weeks on rat	354 gm/kg
LD50 subcut gpg	3 gm/kg
LDIo iv rbt	100 mg/kg
Eucalyptol	(Lewis 1992)
LD50 orl rat	2480 mg/kg
LD50 ims mus	100 mg/kg
LDIo scu dog	1500 mg/kg
LDIo ims gpg	2250 mg/kg
Methyl salicylate	(Bennett et al. 1984)
LDio ori hum	506 mg/kg
LD50 orl rat	887 mg/kg
LD50 orl dog	2100 mg/kg
LD50 orl rbt	1300 mg/kg
LD50 orl gpg	1060 mg/kg

Chemical	Value and Source
Methyl salicylate	(J.T. Baker Inc. 1989b)
LD50 orl rat	887 mg/kg
LD50 orl rbt	1300 mg/kg
Methyl salicylate	(Lewis 1992)
oral rat LD50	887 mg/kg
oral mus LD50	1110 mg/kg
oral dog LD50	2250 mg/kg
orl rbt LD50	1300 mg/kg
orl gpg LD50	1060 mg/kg
Methyl salicylate	(Opdyke 1979)
oral mus LD50	1110 mg/kg
oral mus LD50	887 mg/kg
oral rat LD50	1250 mg/kg
oral gpg LD50	1060 mg/kg
oral gpg LD50	700 mg/kg
oral rbt LD50	1300 mg/kg
oral rbt LD50	2800 mg/kg
oral dog LD50	2100 mg/kg
Methyl salicylate	(Sadusky 1990)
LDIo orl hum	506 mg/kg
LD50 orl rat	887 mg/kg
LD50 orl dog	2100 mg/kg
LD50 orl rbt	1300 mg/kg
LD50 orl gpg	1060 mg/kg
Methyl salicylate	(HMIS 1994)
LD50 orl rat	887 mg/kg
On the same and a same	(Lauria 1002)
Sodium carbonate	(Lewis 1992) 4090 mg/kg
LD50 orl rat	2300 mg/m3/2H
LC50 ihl mus	1200 mg/m3/2H
LC50 ihl mus LD50 ipr mus	117 mg/kg
LD50 ipi mus	2210 mg/kg
LC50 ihl gpg	800 mg/m3/2H
Loop in gpg	
Polyethylene oxide	(Lewis 1992)
LD50 orl rat	50 g/kg
LD50 ipr rat	11550 mg/kg
LD50 scu mus	18 g/kg
LD50 ivn mus	16 g/kg
LD50 orl rbt	76 g/kg
LD50 orl gpg	50900 mg/kg
Hydroxyethyl cellulose	(Lewis 1992)
LD50 orl rat	4270 mg/kg
LD50 orl mus	6500 mg/kg
LC50 ihl mus	4 g/m3/2H
LD50 skn rbt	3560 mg/kg
LD50 unr mam	26 g/kg
Chronal	(Lewis 1992)
Glycerol	12600 mg/kg
LD50 orl rat LD50 ipr rat	8728 mg/kg
LD30 ipi fat ,	2.50 mg/mg

Chemical		Value and Source
LD50 scu rat	100 mg/kg	
LD50 scu rat	5566 mg/kg	
LD50 orl mus	4090 mg/kg	
LD50 ipr mus	8982 mg/kg	
LD50 scu mus	91 mg/kg	•
LD50 inv mus	6199 mg/kg	
LD50 ivn rbt	53 mg/kg	
LD50 orl gpg	7750 mg/kg	
Glycerol	(HMIS 1994)	
OSHA PEL	10 mg/m3	
ACGIH TLV	10 mg/m3	
Diethyl malonate (DEM)	(HMIS 1994)	
LD50 rat oral	1500 mg/kg	
LD50 rat oral	6400 mg/kg	
ED30 Illouse oral	0400 mg/kg	
Ferrous ammonium sulfate	(HSDB 1987)	
NIOSH TWA	1 mg/m ³	
2,2 Dipyridyl	(R.W. Grady et al 1976)	
LD50 ipl mus	200 mg/kg	
2,2 Dipyridyl	(Lewis 1992)	
LD50 orl rat	100 mg/kg	
LD50 scu rat	131 mg/kg	
LD50 ipr mus	200 mg/kg	
	(I avvia 4000)	
Phenophthalein	(Lewis 1992)	
LDdlo ipr rat	500 mg/kg	
Isopropyl alcohol (isopropanol)	(J.T. Baker Inc. 1990)	
LD50 skn rbt	13 g/kg	
OSHA PEL	900 mg/kg	
Isopropal alcohol (isopropanol)	(NIOSH 1976)	
LD50 orl 14 day old rat	5.6 ml/kg	
LD50 orl young adult rat	6.0 ml/kg	
LD50 orl older adult rat	6.8 mi/kg	
LD50 orl rbt	10.2 ml/kg	
LD50 skn rbt	16.4 ml/kg	
Isopropal alcohol (isopropanol)	(Lewis 1992)	
LD50 orl rat	5045 mg/kg	
LD50 ipr rat	2735 mg/kg	
LD50 ivn rat LD50 orl mus	1099 mg/kg	
	3600 mg/kg 4477 mg/kg	
LD50 ipr mud LD50 ivn mus	1509 mg/kg	
LD50 ivii mas LD50 ori dog	4797 mg/kg	
LD50 on dog LD50 skn rbt	12800 mg/kg	
LD50 skillbt LD50 ipr rbt	667 mg/kg	
LD50 ipr gpg	2560 mg/kg	
LD50 ipr ham	344 mg/kg	
Titonium diovido	(Lewis 1992)	
Titanium dioxide TCLo, ihl rat	(Lewis 1992) 250 mg/m ³	
TOLO, IIII TAL	200 mg/m	

Chemical	Value and Source
PEG 200 (mixed butyl mercaptan)	
oral daily 13 wks (monkeys)	lesions, oxalate crystals in the renal cortex
no adverse effects	oral daily for 13 wks (rats)
LDo,Edo mice ipl 1 dose	no observed effects
LD50 rat, iv, acute	>10.0 mg/kg
LD50 rat orl	28.13 gm/kg
LD50 ipl mouse	7.5 ml/kg
LD100 ipl mouse	10.0 mg/kg
EDo ipl mouse	1.0 mg/kg
PEG 200 (mixed butyl mercaptan)	
LD50 orl rat	28,900 mg/kg
LD50 orl mus	38,300 mg/kg
LD50 orl rbt	19,900 mg/kg
PEG 200 (mixed butyl mercaptan)	(Bennett et al. 1984)
LD50 orl rat	28,900 mg/kg
LD50 orl mus	38,300 mg/kg
LD50 orl rbt	19,900 mg/kg
PEG 200 (mixed butyl mercaptan)	(Lewis 1992)
LD50 orl rat	28900 mg/kg
LD50 orl muş	38300 mg/kg
LD50 ipr mus	7500 mg/kg
LD50 orl rbt	19900 mg/kg

ACGIH- American Conference of Governmental Industrial Hygienists

OSHA - Occupational Safety and Health Administration

NIOSH - National Institute for Occupational Safety and Health

TWA - time weighted average

STEL - standard threshold exposure limit

PEL - permissible exposure limit

MSDS - material safety data sheet

NOEL -no observable effect level

TClo - lowest concentration to produce a toxic effect

TDIo - lowest dose to produce a toxic effect

LDio - lowest lethal dose

EDo - dose at which effects were observed

ihl- inhalationmus - mouseipl - intraperitonealrbt - rabbitinv - intravenousgpg - guinea pigorl - oralham - hamsterscu - subcutaneousmam - mammalskn - skin (dermal)ckn - chicken

ocu - ocular

ims - intramuscular unr - route unreported

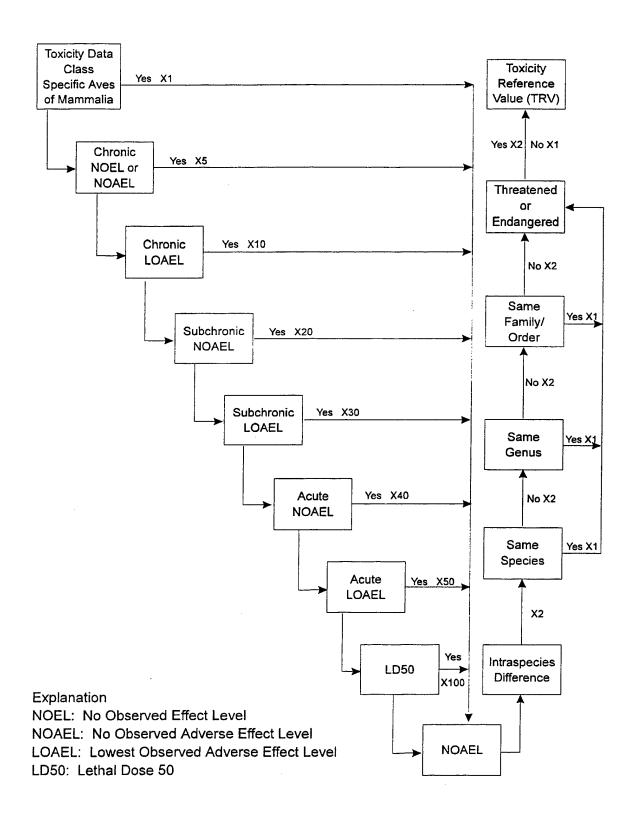


Figure 10. Decision tree for calculating TRV derivation (Wentsel et al. 1994).

TABLE 11. Calculations of Toxicity Reference Values for selected chemicals.

Biolog				Toxicity	Uncertainty Factor for	
Chemical	Pathway	Target		Value	TRV .	TRV
Fog oil chronic	Inhalation	Bats	0.1	g/m³ LOAEL _{dog, rat, mus, rbt,}	160	.00063 g/m ³
•		Eagles	0.1	g/m ³ LOAEL _{adog, rat, mus, rbt}	320	.00031 g/m ³
Fog oil acute	Inhalation	Bats	60	g/m³ LC ₅₀ rat	16	3.8 g/m ³
		Eagles	60	g/m³ LC ₅₀ rat	32	1.88 g/m ³
Fog oil chronic	Ingestion	Bats	22	g/kg LD ₅₀ mus	1600	0.014 g/kg
		Eagles	22	g/kg LD ₅₀ mus	3200	0.0069 g/kg
Fog oil acute	Ingestion	Bats	17.6	g/kg LOAEL rat	16	1.1 g/kg
		Eagles	17.6	g/kg LOAEL rat	32	0.55 g/kg
Fog oil chronic	Dermal	Bats	2	g/kg LOAEL rat	160	1.4 g/kg
		Eagles	2	g/kg LOAEL rat	320	0.68 g/kg
Fog oil acute	Dermai	Bats	216	g/kg TD _{lo} mus	16	0.13 g/kg
		Eagles	216	g/kg TD _{lo} mus	32	0.0625 g/kg
TPA	Inhalation	Bats	8.62	g/m³ calculated NOAEL	1	8.6200 g/m ³
		Eagles	8.62	g/m³ calculated NOAEL	32	0.2694 g/m ³
Kaolin	Inhalation	Bats	0.01	g/m³ ACGIH TLV	16	0.0006 g/m ³
		Eagles	0.01	g/m ³ ACGIH TLV	32	0.0003 g/m ³
Dimethyl phthalate	Ingestion	Bats	6.8	g/kg NOAEL rat	1600	0.0043 g/kg
		Eagles	6.8	g/kg NOAEL rat	3200	0.0021 g/kg
Sodium Carbonate	Inhalation	Bats	2.3	g/m³ LC ₅₀ rat	1600	0.0014 g/m ³
Socialiti Gal Boriato		Eagles	2.3	g/m³ LC ₅₀ rat	3200	0.0007 g/m^3
	Ingestion	•	4.09	g/kg LD ₅₀ rat	1600	0.0026 g/kg
		Eagles	4.09	g/kg LD ₅₀ rat	3200	0.0013 g/kg
Polyethylene oxide	Inhalation	Bats	50000	g/m ³ from LD ₅₀ rat	1600 ⁻	31.2500 g/m ³
, oryonny one one		Eagles	50000	g/m ³ from LD ₅₀ rat	3200	15.6250 g/m ³
	Ingestion	-	50	g/kg LD ₅₀ rat	1600	0.0313 g/kg
		Eagles	50	g/kg LD ₅₀ rat	3200	0.0156 g/kg
Hydroxyethylcellulose	Inhalation	Bats	4	g/m³ LC ₅₀ rat	1600	0.0025 g/m ³
r iyaroxyouryioonarooo		Eagles	4	g/m³ LC ₅₀ rat	3200	0.0013 g/m ³
	Ingestion	•	4.27	g/kg LD ₅₀ mouse	1600	0.0027 g/kg
		Eagles	4.27	g/kg LD ₅₀ mouse	3200	0.0013 g/kg
Glyceroi	Inhalation	Bats	0.01	g/m³ OSHA PEL human	1600	0.0006 g/m ³
Ciyocioi	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Eagles	0.01	g/m³ OSHA PEL human	3200	0.0003 g/m ³
	Ingestion	-	12.6	g/kg LD ₅₀ rat	1600	0.0079 g/kg
		Eagles	12.6	g/kg LD ₅₀ rat	3200	0.0039 g/kg
Diethyl malonate	Inhalation	Bats	1500	g/m³ from LD ₅₀ rat	1600	0.9375 g/m ³
D.S. III I I I I I I I I I I I I I I I I		Eagles	1500	g/m³ from LD ₅₀ rat	3200	0.4688 g/m ³
		•				9

					Uncertainty	
		Biological		Toxicity	Factor for	
Chemical	Pathway	Target		Value	TRV	TRV
	Ingestion	Bats	1.5	g/kg LD ₅₀ rat	1600	0.0009 g/kg
		Eagles	1.5	g/kg LD ₅₀ rat	3200	0.0005 g/kg
Ferrous ammonium	Inhalation	Bats	0.001	g/m³ NIOSH	1600	6 E-7 g/m ³
sulfate		Eagles	0.001	g/m³ NIOSH	3200	3 E-7 g/m ³
Methyl salicylate	Inhalation	Bats	1.5	g/m³ LD ₅₀ human	1600	0.0009 g/m ³
		Eagles	1.5	g/m³ LD ₅₀ human	3200	0.0005 g/m ³
	Ingestion	Bats	0.887	g/kg LD ₅₀ rat	1600	0.0006 g/kg
		Eagles	0.887	g/kg LD ₅₀ rat	3200	0.0003 g/kg
2,2-Dipyridyl	Inhalation	Bats	100	g/m³ LD ₅₀ rat	1600	0.0625 g/m ³
		Eagles	100	g/m ³ LD ₅₀ rat	3200	0.0313 g/m ³
	Ingestion	Bats	0.1	g/kg LD ₅₀ rat	1600	0.0001 g/kg
		Eagles	0.1	g/kg LD ₅₀ rat	3200	0.00005 g/kg
Phenophthalein	Inhalation	Bats	500	g/m³ LD _{io} rat	1600	0.3125 g/m ³
		Eagles	500	g/m³ LD _{lo} rat	3200	0.1563 g/m ³
	Ingestion	Bats	0.5	g/kg LD₀ rat	1600	0.0003 g/kg
		Eagles	0.5	g/kg LD _{lo} rat	3200	0.0002 g/kg
Isopropano!	Inhalation	Bats	0.9	g/m³ OSHA PEL human	1600	0.0006 g/m ³
		Eagles	0.9	g/m³ OSHA PEL human	3200	0.0003 g/m ³
	Ingestion	Bats	5.05	g/kg LD ₅₀ rat	1600	0.0032 g/kg
		Eagles	5.05	g/kg LD ₅₀ rat	3200	0.0016 g/kg
Titanium dioxide	Inhalation	Bats	0.25	g/m³ TC _{lo} rat	1600	0.0002 g/m ³
		Eagles	0.25	g/m³ TC _{lo} rat	3200	0.0001 g/m ³
PEG 200	Inhalation	Bats	28900	g/m³ from LD ₅₀ rat	1600	18.0625 g/m ³
		Eagles	28900	g/m ³ from LD ₅₀ rat	3200	9.0313 g/m ³
	Ingestion	Bats	28.9	g/kg LD ₅₀ rat	1600	0.0181 g/kg
		Eagles	28.9	g/kg LD ₅₀ rat	3200	0.0090 g/kg
Ethyl phthalate	Ingestion	Bats	8.6	g/kg LD ₅₀ rat	1600	0.0054 g/kg
		Eagles	8.6	g/kg LD ₅₀ rat	3200	0.0027 g/kg
	Inhalation	Bats	1	g/m³ TC _{lo} human	1600	0.0006 g/m ³
		Eagles	1	g/m ³ TC _{io} human	3200	0.0003 g/m ³

ACGIH- American Conference of Governmental Industrial Hygienists OSHA - Occupational Safety and Health Administration NIOSH - National Institute for Occupational Safety and Health

PEL - permissible exposure limit

Section 8 Exposure Assessment Section VIII:
Exposure Assessment

8.1 INTRODUCTION

Exposure assessment is the process of converting predicted stressor concentrations at the contact point into a dose. For our predictive ERA, we used an air dispersion model to determine the concentration of fog oil smoke, terephthalic acid smoke, and titanium dioxide smoke at contact points. To assess the dispersion of stressors we did not model, we evaluated the mode and length of release to predict stressor concentration in the environment.

We performed a screening level risk assessment to determine which stressors had potential to adversely affect receptors. We were able to eliminate many chemical stressors from detailed analysis as described in Section 8.2. We used the following criteria to select chemicals of potential concern from the screening risk assessment:

- existence of a complete exposure pathway
- Hazard Quotient calculated in screening risk assessment greater than 1.0
- known carcinogenic properties

We competed three basic steps in assessing exposure: identify exposure pathways, characterize exposure setting, and quantify exposure. In ecological risk assessments, exposure assessments and toxicity assessments often are combined into an analysis phase (EPA 1992b). We performed a toxicity assessment first and incorporated the information into the exposure assessment.

8.2 IDENTIFICATION OF COMPLETE EXPOSURE PATHWAYS

A complete exposure pathway consists of a receptor, chemical source or release (stressor), exposure point, and exposure route. We evaluated the potential for each stressor to contact receptors through inhalation, ingestion, or dermal absorption pathways. The screening risk assessment was performed to determine which stressors had potential to adversely affect receptors. We estimated the concentration of each stressor based on the quantity expected to be used at Fort Leonard Wood. We examined the method of release, release location, and release mechanism. Stressors with exposure pathways that would not, based on information provided, reach receptors were eliminated from further analysis. All proposed BIDS Training, FOX Training, and non-specific simulants were eliminated in this manner except titanium dioxide.

8.2.1 Stressors Eliminated Due to Incomplete Exposure Pathways

We eliminated certain stressors in the screening risk assessment based on proposed location of use or deployment mechanism at Fort Leonard Wood (Table 12). We do not believe there is potential for these chemicals to contact receptors.

8.2.2 Stressors Eliminated Based on Toxicity or Quantity

Three Persistent Chemical Training Simulants (PCAS); Soman (GD), Mustard Lewisite, and Chemical Agent Disclosure Solution (CADS), were evaluated in the screening risk assessment. Toxicity values for GD, Mustard Lewisite, and CADS could not be identified; we used toxicity values for individual chemical constituents of each PCAS.

PCAS will be dispersed remotely, using the Chemical/Biological Training Simulant and Delivery System (CBTSADS), or will be dispersed manually. We evaluated PCAS dispersed from a CBTSADS. It is estimated the CBTSADS will disperse PCAS over an area of 10,000 m². We evaluated PCAS based on yearly use of 1800 liters (9 liters per training event, 200 training events per year) and training duration of 2 hour per event. We assumed PCAS would be dispersed in 100,000 m³ of air. Concentrations of PCAS components dispersed by CBTSADS will be below toxicity threshold values for Indiana bats, gray bats, or bald eagles. PCAS were therefore eliminated from further assessment in the ERA.

TABLE 12. Chemical stressors eliminated from detailed analysis in the Ecological Risk Assessment based on expected location of use and/or deployment mechanism at Fort Leonard Wood.

Chemical Stressor	Reason for Elimination					
FOX training simulants Anisole	FOX simulant only for interior training in the FOX Simulator therefore, chemical will not contact receptors					
Benzaldehyde	see anisole					
Cyclohexane	see anisole					
DEM - diethyl malonate	see anisole					
Diethyl phthalate	see anisole					
Dimethyl phthalate	FOX simulant for interior and exterior training. In exterior FOX simulant training, a small hole is dug and a pan is placed in the hole. Approximately 40 pounds of clean sand are placed in the pan, into which the simulant is poured. After the exercise is complete, the pan is removed and reused in another exercise. There is not sufficient time for the simulant to contact receptors or their food sources as long as the pan of sand is removed within 2 hours of placement.					
Ethyl phthalate	same as dimethyl phthalate					
Eucalyptol	same as dimethyl phthalate					
MES - Methyl salicylate	same as dimethyl phthalate					
Non-specific simulants PEG 200	PEG 200 will be used at a maximum of 8 hasty decontamination sites. The field training exercise will involve ground based liter containers. These containers will spray PEG 200 into the air (approximately 5 m) when triggered. The purpose of the exercise is to cover equipment and personnel with PEG 200, so soldiers can practice decontamination procedures. There is not a complete exposure pathway for bats or bald eagles as long as PEG 200 is not sprayed into trees, and is used outside bat management zones.					

PCAS are also dispersed manually. A hand pump will be used to spray 1 pint bottles with spray heads. PCAS is delivered directly on the ground. This dispersion method does not present a direct exposure pathway for Indiana bats, gray bats, or bald eagles.

8.2.3 Stressors Carried Through Detailed Ecological Risk Assessment

Upon completion of screening processes, fog oil, terephthalic acid, and titanium dioxide warranted detailed analysis. These stressors were evaluated to assess effects to Indiana bats, gray bats, and bald eagles on Fort Leonard Wood.

8.3 CHARACTERIZATION OF EXPOSURE SETTING

We examined life history data for each receptor, including portion of their life spent on the installation and diet composition. Food sources can act as exposure sites. A description of soil types, geology, hydrology, flora, and fauna on the Installation is provided in Section V. This information facilitates interpretation of the environmental fate of stressors.

8.3.1 Indiana Bats

Indiana bats at Fort Leonard Wood may be exposed to stressors while foraging, roosting, or hibernating on the Installation (Figure 11). Stressors may be ingested, inhaled, or dermally absorbed by Indiana bats. Indiana bats may be exposed to stressors directly, or may be exposed through another source (e.g. contaminated insect prey).

8.3.1.1 Foraging Indiana Bats

Indiana bats forage at Fort Leonard Wood from April through October. Section 3.1.4 of this appendix provides additional information regarding foraging habits of Indiana bats. Figure 12 presents a primary food chain for Indiana bats at Fort Leonard Wood. This food chain illustrates food sources of the Indiana bat and the food sources of typical prey.

8.3.1.2 Roosting Indiana Bats

Male, female, and young Indiana bats roost, primarily during daylight hours, in trees during the summer. Potentially suitable habitat occurs nearly installation-wide. Information regarding roosting activities of Indiana bats is provided in Section 3.1.3 of this appendix.

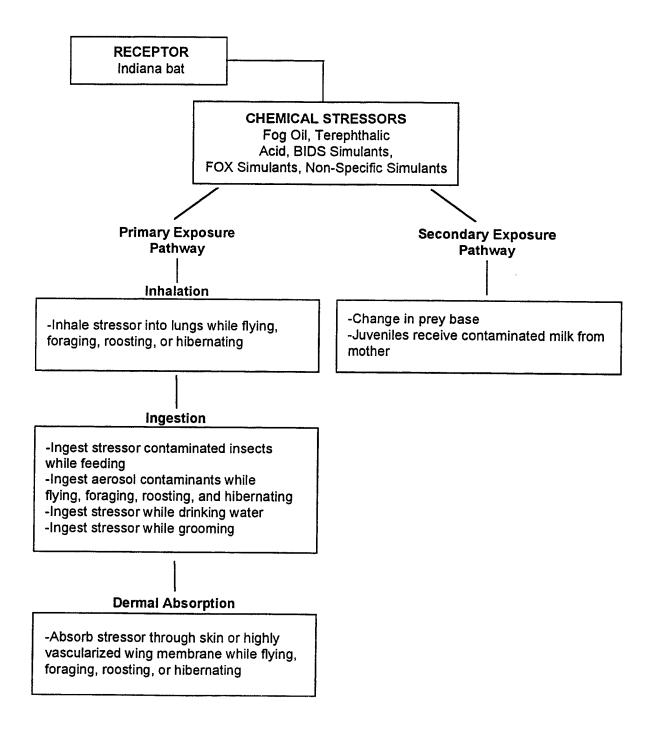


FIGURE 11. Pathways through which Indiana bats may be exposed to stressors at Fort Leonard Wood.

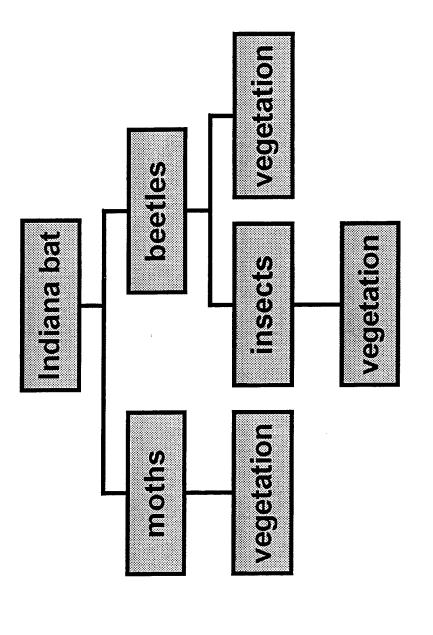


FIGURE 12. Food chain of Indiana bats at Fort Leonard Wood, Missouri.

8.3.1.3 Hibernating Indiana Bats

Indiana bats hibernate in 4 caves at Fort Leonard Wood: Brooks, Wolf Den, Davis No. 2, and Joy (Figure 13). Indiana bats also hibernate in Great Spirit Cave, near the installation (Figure 13). Additional information regarding Indiana bat hibernation is provided in Section 3.1.3 of this Appendix.

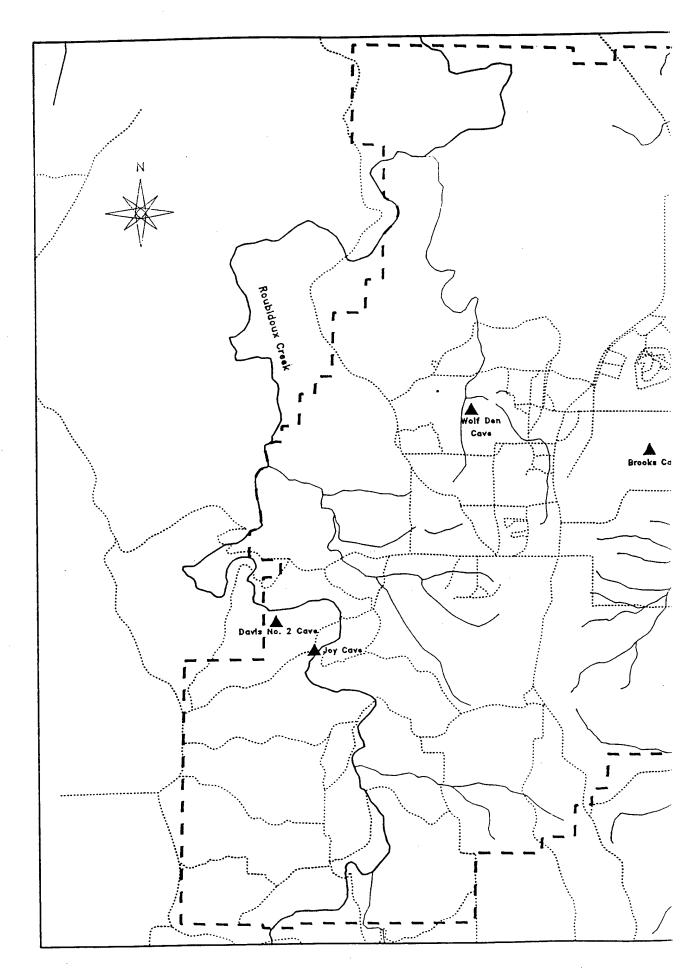
Indiana Bat Hibernacula

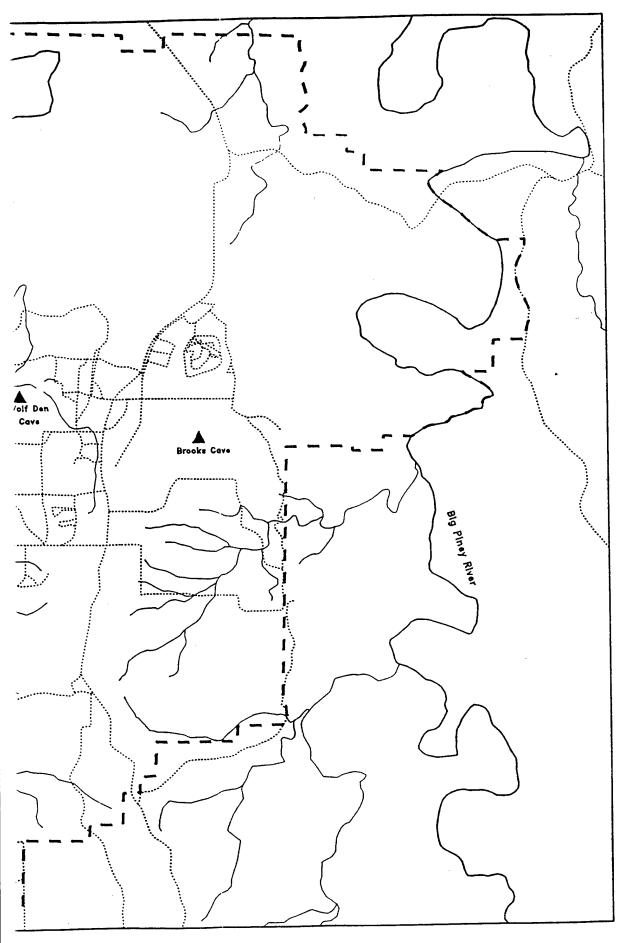
Indiana bats may be exposed to chemical stressors in hibernacula. Physical characteristics of hibernacula can influence chemical behavior inside the cave. Stressors can persist, or be rapidly removed from the cave atmosphere depending on the size and air flow dynamics of the cave. Table 13 provides describes each hibernaculum on the installation.

The entrance to Brooks Cave is in a sinkhole. The top of the sinkhole is approximately 30 m by 50 m. Within the sinkhole is a smaller sink, approximately 9 m in diameter. The entrance to the cave is located within the inner sink. The entrance faces west and is 1.5 m high and 2.5 m wide. The cave floor drops from the entrance at a 24° angle for 38 m, opening into a main room which has a flat ceiling and floor. The main room is approximately 5 m high, 10 m wide, and 57 m long. Most Indiana bats hibernate on the ceiling of the main room. The

TABLE 13. Characteristics of Indiana bat hibernacula on Fort Leonard Wood.

	Brooks	Wolf Den	Joy	Davis No. 2
Entrance area (ft²)	38	72	262	147 and 10
Cave volume (ft ³)	180,860	110,906	81,965	94,460
Entrance area/cave volume ft²/cm	6.89E-06	2.13E-05	1.05E-04	3.47E-06





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FIGURE 13. In on Fort Leonard W

▲ Indiana

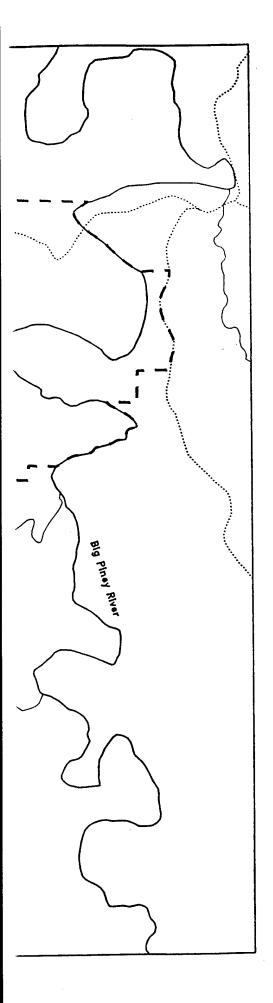
Fort Lec

-----Road

____ River /

Kil

3D/ENVIF



APPENDIX IV TO BIOLOGICAL ASSESSMENT:

RELOCATION OF U.S. ARMY CHEMICAL SCHOOL AND MILITARY POLICE SCHOOL TO FORT LEONARD WOOD, MISSOURI

FIGURE 13. Indiana bat hibernacula on Fort Leonard Wood, Missouri.

- ▲ Indiana Bat Cave
- Fort Leonard Wood Boundary

----Road

— River / Stream

Kilometers 0 2 4

3D/ENVIRONMENTAL

cave terminates at a sandstone breakdown in a room 10 m high and 15 m wide. The cave has a total length of 135 m. The passage beyond the main room is not suitable for hibernation of Indiana bats, but it affects airflow dynamics in the cave.

The entrance to Wolf Den Cave is on the western side of a sinkhole that is approximately 8 m deep. The entrance to the cave is restricted by breakdown. There are 3 openings (the largest of which is 1 m high and 2 m wide) to the same passage. The cave floor and ceiling slope down 40° from the entrance for 20 m. The floor and ceiling become flat, forming a large room which is 25 m long. Most Indiana bats hibernate on the ceiling of this area of the cave. The floor inclines steadily for the next 16 m until it meets the ceiling where the passage ends.

Joy Cave is located on an east-facing bluff in the Roubidoux Creek valley. The entrance faces southeast. At the dripline, the entrance is 4 m high and 16 m wide. Excavations near the entrance, combined with collapses of the sandstone ceiling, create a floor that varies in elevation. The ceiling is mostly flat and level throughout the cave. About 35 m into the cave, the passage turns to the north. A rise in the ceiling forms a domed room where most of the Indiana bats hibernate. At the back of this dome room, the ceiling drops until the total passage height is 0.8 m. The passage (approximately 1 m high and 10 m wide) continues another 30 m before turning east. The passage turns north again after 30 m. A dry passage splits off to the northeast and ends within 10 m. A passage (1.5 m high and 2 m wide) containing a stream continues to the northwest.

Davis No. 2 Cave passes through a ridge (i.e., there is an entrance on each side) on the south side of Roubidoux Creek. The larger entrance (2.1 m high and 7 m wide) faces northeast, toward the creek. The passage turns 35 m from the main entrance, and continues for another 12 m where the ceiling rises slightly to form a dome. Most Indiana bats hibernate in this area of the cave. The passage continues another 114 m before the small cave entrance (0.8 m high and 1.4 m wide) is reached. The two entrances in this cave permit, under certain conditions, airflow through the cave.

Air Flow at Indiana Bat Hibernacula

3D/Environmental installed meteorological stations at the entrance, and inside each

Indiana bat hibernacula. We collected data from October through March to characterize air

flow into and out of each cave. We developed models describing seasonal air flow in each

cave. Table 14 presents information used to develop air flow models for each cave. No air

flow model was developed for Great Spirit Cave. We assessed effects to Indiana bats within

the cave based on the concentration of contaminants expected to reach the cave.

Contaminant concentrations were assumed consistent throughout the training event.

Air flow models were used to determine the time a contaminant would remain in the air

inside each cave. The models are based on the amount of time required for the contaminant

to reach equilibrium inside the cave. Caves that maintain a positive barometric pressure

gradient inside (pressure greater inside than outside), will reach equilibrium faster and the

contaminant will not remain in the air as long as a cave with a negative pressure gradient. The

following equations describe the cave air flow model.

Equation 1 - Determining contaminant concentrations inside the cave

 $C_1kt = X$

where:

 C_1 = Concentration g/m³ at the mouth

k = mixing constant 1/seconds

t =time in seconds concentration is at the mouth (e.g. amount of time generators are

running)

X =Concentration g/m³ inside the cave

Equation 2 - Calculating the equilibrium constant for a concentration

 $\frac{-lnX}{Cc} = Ec$

where:

(-ln) = natural logarithm

X =Concentration g/m³ inside the cave

Cc = Concentration of concern (i.e. TRV or NOAEL)

Ec = Equilibrium constant for concentration

TABLE 14. Information used to develop air flow models for Indiana bat hibernacula at Fort Leonard Wood, Missouri.

Parameter	Brooks Cave	Wolf Den Cave	Joy Cave	Davis No. 2 Cave
Cave maximum temperature (K)	286	294	287	291
Cave minimum temperature (K)	278	276	267	267
Cave maximum pressure (mbar)	1007	1004	1002	1026
Cave minimum pressure (mbar)	959	958	656	096
Maximum computed air velocity (1 mbar dP, cm/s)	41.3399	41.9360	41.4121	41.6780
Minimum computed air velocity (1 mbar dP, cm/s)	39.7744	39.6902	39.0767	38.6169
Maximum flow rate/cave volume (1/s)	0.0003	0.0009	0.0043	0.0001
Minimum flow rate/cave volume (1/s)	0.00027	0.0008	0.0041	0.0001
Measured dispersion constant range (Q/KV)	0.0099-0.0021	0.0121-0.0036	0.0054-0.0021	0.0101-0.0035
Highest correlation dispersion constant	0.0099	0.0057	0.0054	0.0035
Maximum mixing constant (1/s)	0.0288	0.1567	0.8042	0.0413
Minimum mixing constant (1/s)	0.0277	0.1483	0.7589	0.0383

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Equation 3 - Estimating the time contaminant remains in atmosphere

$$Ec \div \frac{Q}{KV} = Tc$$

where:

Ec = Equilibrium Constant Q/KV = Dispersion Constant

Tc = Time contaminant remains above the concentration of concern inside the cave

We calculated the time fog oil smoke from static training (Table 15) and mobile training (Table 16) will remain above safe levels in Indiana bat hibernacula. The concentration measured from the isopleths for static (Figures 14, 15, 16, and 17) and isopleths for mobile fog oil training (Figures 18, 19, 20, and 21) for Pasquill categories B, C, D, and E are presented for the inhalation pathway. We used the duration of smoke training events to determine the time required for fog oil to reach equilibrium within hibernacula, and for concentrations to be reduced to levels below a TRV or toxicity threshold. The concentration of fog oil that will reach the mouth of the cave is dependent upon distance between the source and the cave and Pasquill category. We performed similar analyses for the inhalation of TPA and titanium dioxide, using cave air flow models to determine stressor concentrations in caves and the amount of time the stressor would remain above toxicity levels.

We applied a similar method to estimate the dose Indiana bats in hibernacula would receive on their skin. We used deposition isopleths (Figures 22, and 23) to determine what stressor concentrations would reach the caves. Fog oil deposition isopleths for Pasquill categories B, C, and D are included in Attachment B.

8.3.2 Gray Bats

Gray bats at Fort Leonard Wood may be exposed to chemical stressors while foraging and roosting in maternity, transient, and bachelor caves. No bachelor caves have been identified on Fort Leonard Wood. We focused our analysis of effects to roosting bats on those individuals in maternity caves (Figure 24). Stressors may be ingested, inhaled, or dermally

TABLE 15. Parameters of models characterizing air flow in hibernacula, and estimated duration of concentrations above safe levels inside hibernacula calculated for Pasquill categories B - E for static smoke training*

Chronic time to Reduce Fox. (hrs)	0.27 0.29 0.31 0.33	1.10 1.10 1.10 1.10	0.86 0.86 0.83	0.74 0.74 0.70 0.74
Chr Tox.	0 0 0 0	ਦ ਦ ਦ	0000	0000
Acute time to Reduce Tox. (hrs)	-0.01 0.02 0.04 0.06	0.32 0.32 0.26 0.32	0.36 0.36 0.32 0.36	0.26 0.26 0.23 0.26
Q/KV	0.0099 0.0099 0.0099 0.0099	0.0035 0.0035 0.0035 0.0035	0.0054 0.0054 0.0054 0.0054	0.0057 0.0057 0.0057 0.0057
Chronic Y	9.56 10.48 11.17 11.86	13.80 13.80 13.10	16.78 16.78 16.09 16.78	15.15 15.15 14.46 15.15
Acute Y	-0.23 0.69 1.38 2.08	4.01 4.01 3.32 4.01	7.00 7.00 6.30 7.00	5.36 5.36 4.67 5.36
Chronic X	.3E+00 7.0E-05 .0E-01 2.8E-05 .5E-01 1.4E-05	1.0E-06 1.0E-06 2.0E-06 1.0E-06	5.1E-08 5.1E-08 1.0E-07 5.1E-08	2.6E-07 2.6E-07 5.3E-07 2.6E-07
Acute ×	1.3E+00 5.0E-01 2.5E-01 1.3E-01	1.8E-02 1.8E-02 3.6E-02 1.8E-02	9.2E-04 9.2E-04 1.8E-03 9.2E-04	4.7E-03 4.7E-03 9.4E-03 4.7E-03
Equilibrium Value (g/m³)	0.03 0.07 0.15 0.30	2.07 2.07 1.03 2.07	40.98 40.98 20.49 40.98	8.01 8.01 4.00 8.01
Min Mix Constant (K in 1/sec)	0.03 0.03 0.03	0.04 0.04 0.04	0.76 0.76 0.76 0.76	0.15 0.15 0.15
Distance Concentration (m) from of Fog Oil source (g/m³)	2.00E-04 5.00E-04 1.00E-03 2.00E-03	1.00E-02 1.00E-02 5.00E-03 1.00E-02	1.00E-02 1.00E-02 5.00E-03 1.00E-02	1.00E-02 1.00E-02 5.00E-03 1.00E-02
Distance (m) from source	6037 6037 6037 6037	3927 3927 3927 3927	3682 3682 3682 3682	3878 3878 3878 3878
Caves (Exposure Sites) and Pasquill Categories	Brooks B Brooks C Brooks D Brooks E	Davis No. 2 Cave B Davis No. 2 Cave C Davis No. 2 Cave D Davis No. 2 Cave E	Joy B Joy C Joy D	Wolf Den B Wolf Den C Wolf Den D

^{*}Based on training event lasting for 1.5 hours
The acute TRV is 0.04 g/kg and the Chronic TRV is 0.000021 g/kg.

APPENDIX
EFFECT OF SELECTED CHEMICALS ON INDIANA BATS, GRAY BATS,
AND BALD EAGLES AT FORT LEONARD WOOD, MISSOURI.

TABLE 16. Parameters of models characterizing air flow in hibernacula, and estimated duration of concentrations above safe levels inside hibernacula calculated for Pasquill categories B - E for mobile smoke training*.

Caves (Exposure Sites) and Pasquill Categories	Distance (m) from source	C (g/m³)	Min Mix Constant (K in 1/sec)	Equilibrium Value (g/m³)	Acute X	Chronic X	Acute Y	Chronic Y	Q/KV	Acute Time to Reduce Tox. (hrs)	Chronic Time to Reduce Tox. (hrs)
Musgrave Hollow Brooks Cave B	8031	1.00E-04	0.03		2.5E+00	1.4E-04	-0.92	8.87	6600.0	-0.03	0.25
Brooks Cave C	8031	2.00E-04	0.03		1.3E+00	7.0E-05	-0.23	9.56	0.0099	-0.04	0.27
Brooks Cave E	8031 8031	5.00E-04 1.00E-03	0.03 0.03		5.0E-01	2.8E-05 1.4E-05	0.69 1.38	10.48	0.0099	0.02	0.29
Cannon Range						} ! :	<u> </u>	: :		r O	5
(Mush Paddle) Brooks Cave B	10335	0.005+00	0 03			_	c	c	. 0	Ć	(
Brooks Cave C	10335	1.00E-04	0.03		2.5E+00 ·	1.4E-04	-0 -0 -0	8 87	0.0039	ה ה ק	0 20 20
Brooks Cave D	10335	2.00E-04	0.03	0.03	1.3E+00	7.0E-05	-0.23	9.56	0.0099		0.27
Brooks Cave E	10335	5.00E-04	0.03		5.0E-01	2.8E-05	0.69	10.48	0.0099	0.02	0.29
Bailey Hollow											
Brooks Cave B	5803	2.00E-04	0.03		_	7.0E-05	-0.23	9.56	0.0099	-0.01	0.27
Brooks Cave D	5803	3.00E-04	0.03		5.0E-01 2	2.8E-05	0.69	10.48	0.0099	0.02	0.29
Brooks Cave E	5803	2.00E-03	0.03	0.30		1.4E-U3 7.0E-06	2.08	11.17	0.0099	0.04	0.31 0.33
Ballard Hollow											
Brooks Cave B	8449	1.00E-04	0.03		2.5E+00 ·	1.4E-04	-0.92	8.87	0.0099	-0.03	0.25
Brooks Cave C	8449	2.00E-04	0.03	0.03	1.3E+00 7	7.0E-05	-0.23	9.56	0.0099	-0.01	0.27
Brooks Cave E	8449	1.00E-03	0.03		5.0E-01	7.8E-05	- 0.69 - 28	10.48	0.0099	0.05	0.29
)				5	<u> </u>	0.0099	0.04	0.37
Musgrave Hollow	7000	L	Č			!					
Davis No. 2 Cave B Davis No. 2 Cave C	6624 6624	2.00E-04 2.00E-04	0.0 0.04 0.04	0.0 0.04 4	9.1E-01 (9.1E-01 (5.1E-05 5.1E-05	0.0 0.10	9.89 9.89	0.0035	0.01	0.78
) • •			-	5

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e						
Chronic Time to Reduce Tox. (hrs)	0.86 0.97	01.1 01.1 01.1 01.1	01.1.1.0	0 0.73 0.78 0.86	0.66 0.71 0.74 0.78	0.86 0.86
Acute Time to Reduce Tox. (hrs)	0.08 0.19	0.32 0.32 0.26 0.32	0.32 0.32 0.26 0.32	0 -0.05 0.01	0.16 0.21 0.24 0.28	0.36 0.36
Q/KV	0.0035 0.0035	0.0035 0.0035 0.0035 0.0035	0.0035 0.0035 0.0035 0.0035	0.0035 0.0035 0.0035 0.0035	0.0054 0.0054 0.0054 0.0054	0.0054
Chronic Y	10.80 12.19	13.80 13.10 13.80	13.80 13.80 13.10	0 9.19 9.89 10.80	12.87 13.79 14.48 15.17	16.78 16.78
Acute Y	1.01 2.40	4.01 4.01 4.01	4.01 4.01 4.01	0 -0.59 0.10 1.01	3.08 4.00 4.69 5.39	7.00
Chronic X	2.0E-05 5.1E-06	1.0E-06 1.0E-06 2.0E-06 1.0E-06	1.0E-06 1.0E-06 2.0E-06 1.0E-06	0 1.0E-04 5.1E-05 2.0E-05	2.6E-06 1.0E-06 5.1E-07 2.6E-07	5.1E-08 5.1E-08
Acute X	3.6E-01 9.1E-02	1.8E-02 1.8E-02 3.6E-02 1.8E-02	1.8E-02 1.8E-02 3.6E-02 1.8E-02	0 1.8E+00 9.1E-01 3.6E-01	4.6E-02 1.8E-02 9.2E-03 4.6E-03	9.2E-04 9.2E-04
Equilibrium Value (g/m³)	0.10	2.07 2.07 1.03 2.07	2.07 2.07 1.03 2.07	0.00 0.02 0.10	0.82 2.05 4.10 8.20	40.98
Min Mix Constant (K in 1/sec)	0.04 0.04	0.04 0.04 0.04	0.04 0.04 0.04	0.04 0.04 0.04	0.76 0.76 0.76 0.76	0.76 0.76
C (g/m³)	5.00E-04 2.00E-03	1.00E-02 1.00E-02 5.00E-03 1.00E-02	1.00E-02 1.00E-02 5.00E-03 1.00E-02	0.00E+00 1.00E-04 2.00E-04 5.00E-04	2.00E-04 5.00E-04 1.00E-03 2.00E-03	1.00E-02 1.00E-02
Distance (m) from source	6624 6624	2889 2889 2889 2889	2423 2423 2423 2423	13352 13352 13352 13352	5499 5499 5499 5499	1803 1803
Caves (Exposure Sites) and Pasquill (Categories	Davis No. 2 Cave D Davis No. 2 Cave E	Cannon Range (Mush Paddle) Davis No. 2 Cave B Davis No. 2 Cave C Davis No. 2 Cave D	Bailey Hollow Davis No. 2 Cave B Davis No. 2 Cave C Davis No. 2 Cave D Davis No. 2 Cave D	Ballard Hollow Davis No. 2 Cave B Davis No. 2 Cave C Davis No. 2 Cave C Davis No. 2 Cave D	Musgrave Hollow Joy Cave B Joy Cave C Joy Cave D Joy Cave E	Cannon Range (Mush Paddle) Joy Cave B Joy Cave C

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Caves (Exposure Sites) and Pasquill Categories	Distance (m) from source	C (g/m³)	Min Mix Constant (K in 1/sec)	Equilibrium Value (g/m³)	Acute X	Chronic X	Acute Y	Chronic Y	Q/KV	Acute Time to Reduce Tox. (hrs)	Chronic Time to Reduce Tox. (hrs)
Joy Cave D Joy Cave E	1803 1803	1.00E-02 1.00E-02	0.76 0.76	l	9.2E-04 9.2E-04	5.1E-08 5.1E-08	7.00	16.78 16.78	0.0054 0.0054	0.36 0.36	0.86
Bailey Hollow Joy Cave B Joy Cave C Joy Cave D Joy Cave E	2045 2045 2045 2045	1.00E-02 1.00E-02 5.00E-03 1.00E-02	0.76 0.76 0.76 0.76	40.98 40.98 20.49 40.98	9.2E-04 9.2E-04 1.8E-03 9.2E-04	5.1E-08 5.1E-08 1.0E-07 5.1E-08	7.00 7.00 6.30 7.00	16.78 16.78 16.09 16.78	0.0054 0.0054 0.0054 0.0054	0.36 0.32 0.36	0.86 0.83 0.83
Ballard Hollow Joy Cave B Joy Cave C Joy Cave D Joy Cave E	13821 13821 13821 13821	0.00E+00 1.00E-04 2.00E-04 5.00E-04	0.76 0.76 0.76 0.76	0.00 0.41 0.82 2.05	0 9.2E-02 4.6E-02 1.8E-02	0 5.1E-06 2.6E-06 1.0E-06	0 2.39 3.08 4.00	0 12.18 12.87 13.79	0.0054 0.0054 0.0054 0.0054	0 0.12 0.16 0.21	0 0.63 0.66 0.71
Musgrave Hollow Wolf Den Cave B Wolf Den Cave C Wolf Den Cave D	8609 8609 8609 8609	1.00E-04 2.00E-04 5.00E-04 1.00E-03	0.15 0.15 0.15	0.08 0.16 0.40 0.80	4.7E-01 2.3E-01 9.4E-02 4.7E-02	2.6E-05 1.3E-05 5.3E-06 2.6E-06	0.76 1.45 2.37 3.06	10.55 11.24 12.16 12.85	0.0057 0.0057 0.0057 0.0057	0.04 0.07 0.12 0.15	0.51 0.55 0.59 0.63
Cannon Range (Mush Paddle) Wolf Den Cave B Wolf Den Cave C Wolf Den Cave D	8432 8432 8432 8432	1.00E-04 2.00E-04 5.00E-04 1.00E-03	0.15 0.15 0.15	0.08 0.16 0.40 0.80	4.7E-01 2.3E-01 9.4E-02 4.7E-02	2.6E-05 1.3E-05 5.3E-06 2.6E-06	0.76 1.45 2.37 3.06	10.55 11.24 12.16	0.0057 0.0057 0.0057 0.0057	0.04 0.07 0.12 0.15	0.51 0.55 0.59 0.63
Bailey.Hollow Wolf Den Cave B Wolf Den Cave C Wolf Den Cave D	3861 3861 3861	1.00E-02 1.00E-03 2.00E-03	0.15 0.15 0.15	8.01 0.80 1.60	4.7E-03 4.7E-02 2.3E-02	2.6E-07 2.6E-06 1.3E-06	5.36 3.06 3.75	15.15 12.85 13.54	0.0057 0.0057 0.0057	0.26 0.15 0.18	0.74 0.63 0.66

A E 3861 5.00E-03 0.15 A E 6859 2.00E-04 0.15 A E 6859 5.00E-04 0.15 A E 6859 2.00E-03 0.15	Caves (Exposure Sites) and Pasquill Categories	Distance (m) from source	Distance Min Mis (m) from C (g/m³) Constant source in 1/sec	Min Mix Constant (K in 1/sec)	Equilibrium Value (q/m³)	-	Acute X Chronic X Acute Y Chronic Y Q/KV	Acute Y	Chronic Y		Acute Time to Reduce Tox. (hrs)	Acute Time Chronic Time to Reduce Tox. (hrs)
ave B 6859 2.00E-04 0.15 0.16 2.3E-01 1.3E-05 ave C 6859 2.00E-04 0.15 0.16 2.3E-01 1.3E-05 ave E 6859 2.00E-03 0.15 1.60 2.3E-02 1.3E-06	If Den Cave E	3861	5.00E-03	0.15	4.00	9.4E-03	5.3E-07	4.67	14.46	0.0057	0.23	0.70
6859 2.00E-04 0.15 0.16 2.3E-01 1.3E-05 6859 2.00E-04 0.15 0.16 2.3E-01 1.3E-05 6859 5.00E-04 0.15 0.40 9.4E-02 5.3E-06 6859 2.00E-03 0.15 1.60 2.3E-02 1.3E-06	y Hollow											!
6859 2.00E-04 0.15 0.16 2.3E-01 1.3E-05 6859 5.00E-04 0.15 0.40 9.4E-02 5.3E-06 6859 2.00E-03 0.15 1.60 2.3E-02 1.3E-06	olf Den Cave B	6829	2.00E-04	0.15	0.16	2.3E-01	1.3E-05	1.45	11.24	0.0057	0.07	0.55
6859 5.00E-04 0.15 0.40 9.4E-02 5.3E-06 6859 2.00E-03 0.15 1.60 2.3E-02 1.3E-06	If Den Cave C	6829	2.00E-04	0.15	0.16	2.3E-01	1.3E-05	1.45	11.24	0.0057	0.07	0.55
6859 2.00E-03 0.15 1.60 2.3E-02 1.3E-06	If Den Cave D	6829	5.00E-04	0.15	0.40	9.4E-02	5.3E-06	2.37	12.16	0.0057	0.12	0.59
	olf Den Cave E	6829	2.00E-03	0.15	1.60	2.3E-02	1.3E-06	3.75	13.54	0.0057	0.18	99.0

APPENDIX
EFFECT OF SELECTED CHEMICALS ON INDIANA BATS, GRAY BATS,
AND BALD EAGLES AT FORT LEONARD WOOD, MISSOURI.

^{*}Based on training event lasting for 2.5 hours *The acute TRV is 0.04 g/kg, Chronic TRV is 0.000021 g/kg.

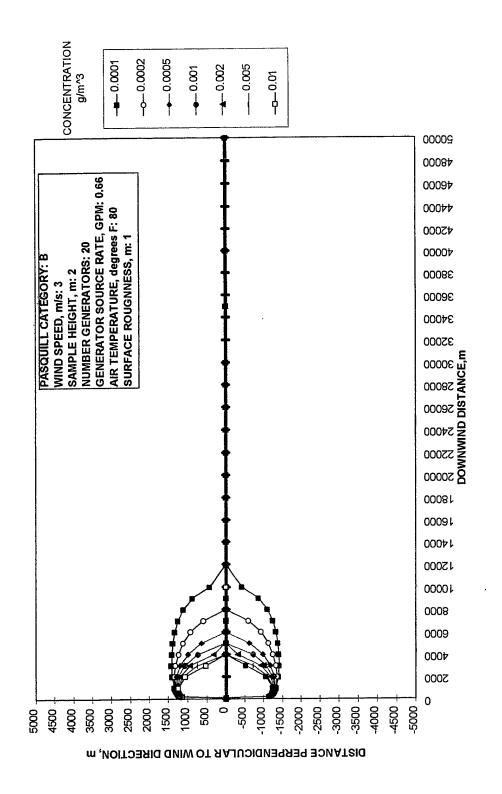


FIGURE 14. Concentration of fog oil smoke (Pasquill B) at varying distances from the static training area.

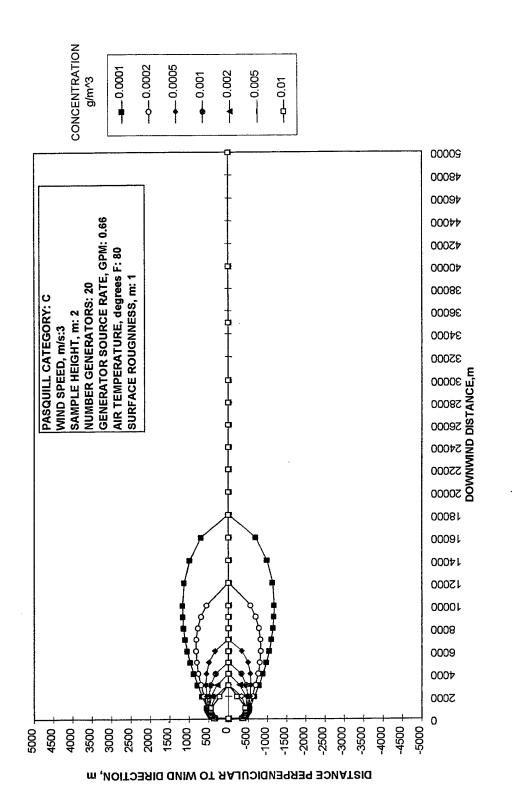


FIGURE 15. Concentration of fog oil smoke (Pasquill C) at varying distances from the static training area.

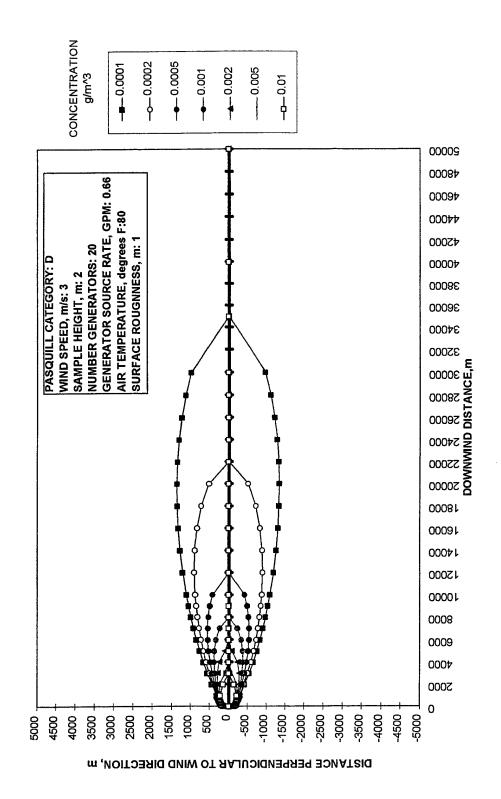


FIGURE 16. Concentration of fog oil smoke (Pasquill D) at varying distances from the static training area.

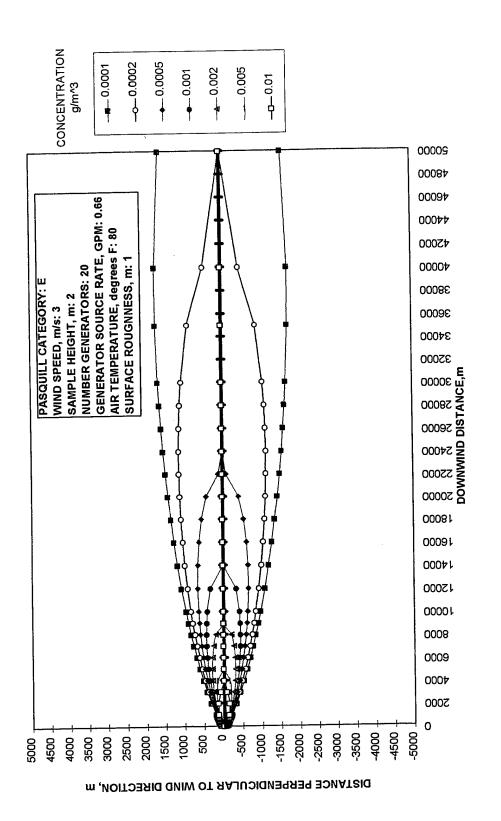


FIGURE 17. Concentration of fog oil smoke (Pasquill E) at varying distances from the static training area.

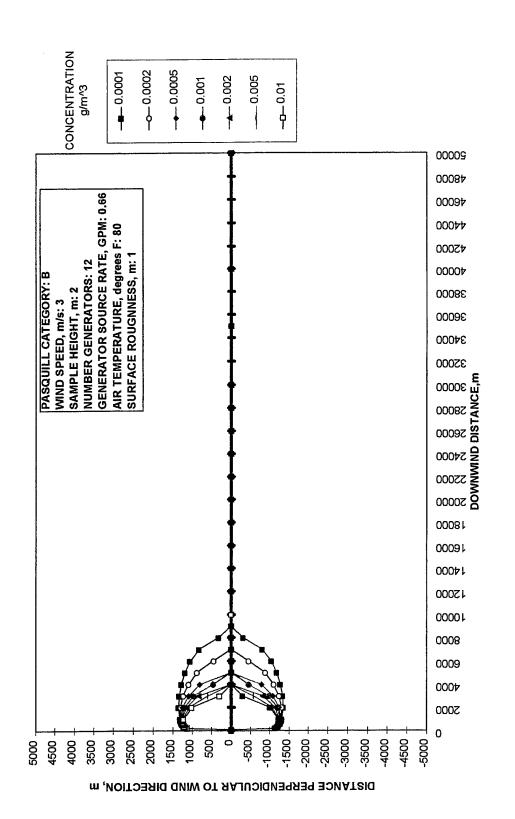


FIGURE 18. Concentration of fog oil smoke (Pasquill B) at varying distances from the mobile training areas.

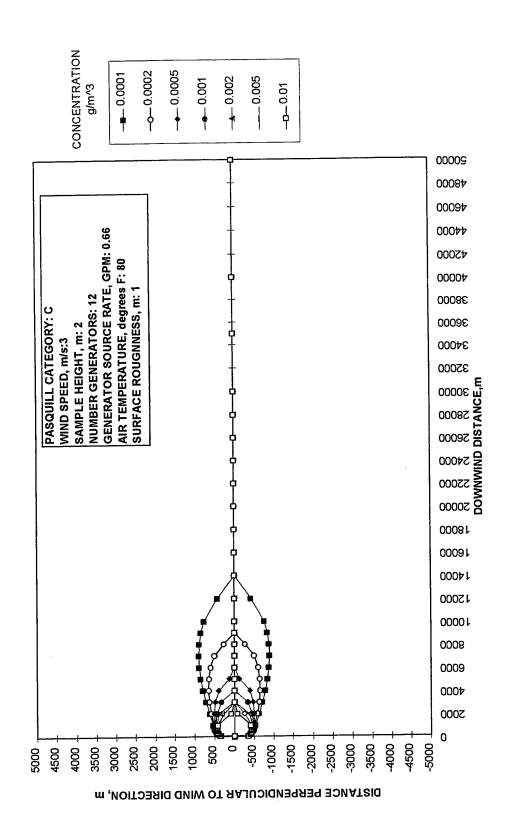


FIGURE 19. Concentration of fog oil smoke (Pasquill C) at varying distances from the mobile training areas.

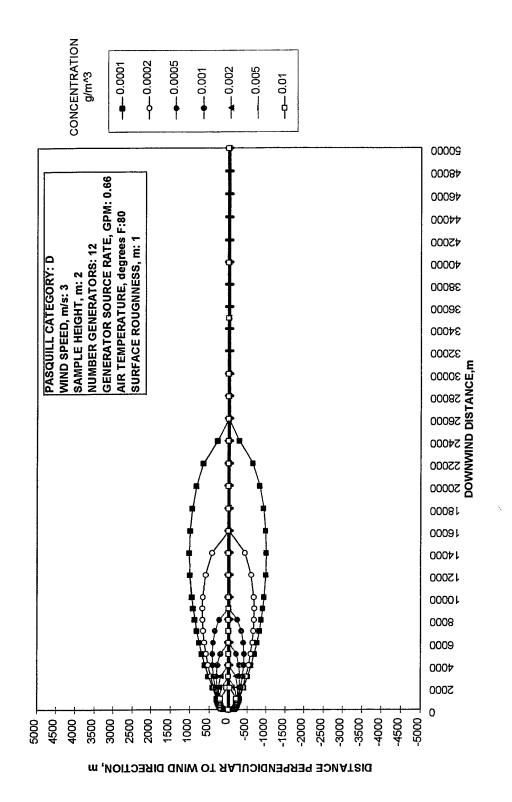


FIGURE 20. Concentration of fog oil smoke (Pasquill D) at varying distances from the mobile training areas.

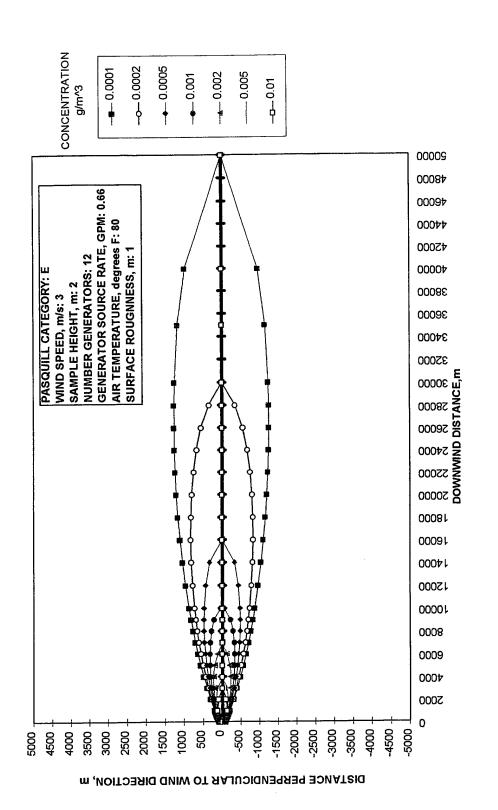


FIGURE 21. Concentration of fog oil smoke (Pasquill E) at varying distances from the mobile training areas.

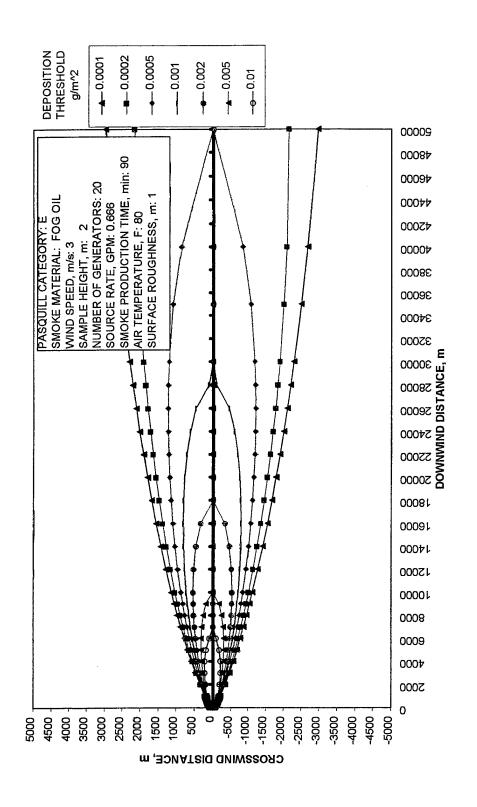


FIGURE 22. Deposition of fog oil smoke (Pasquill E) at varying distances from the static training area.

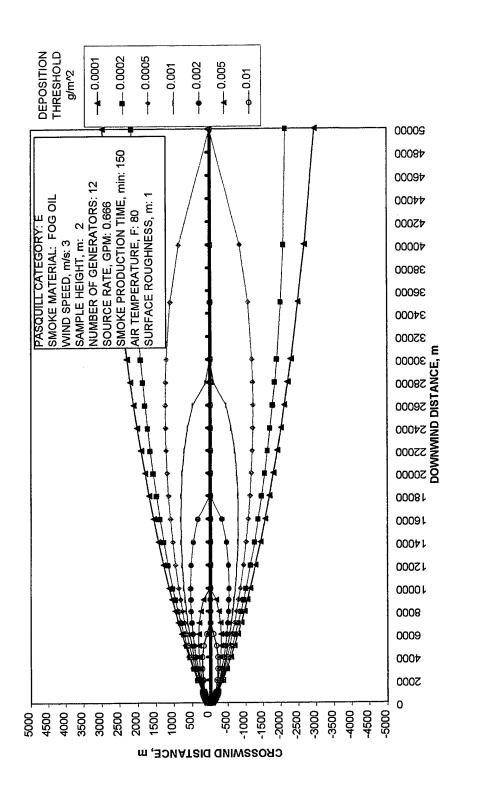


FIGURE 23. Deposition of fog oil smoke (Pasquill E) at varying distances from the mobile training areas.

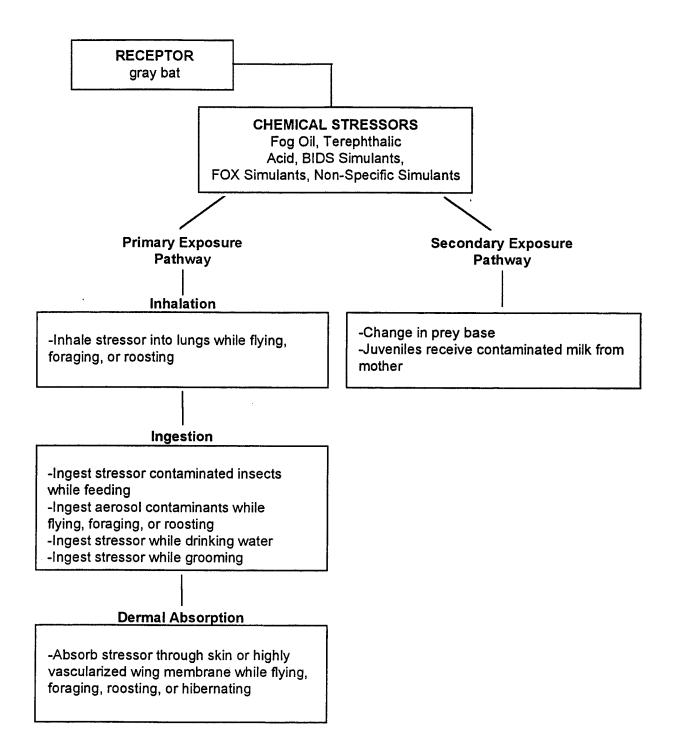


FIGURE 24. Pathways through which gray bats may be exposed to stressors at Fort Leonard Wood.

absorbed by gray bats. Gray bats have the potential for primary exposure to chemical stressors (directly to the organism) or secondary exposure (indirectly to the organism through another source).

8.3.2.1 Foraging Gray Bats

Gray bats normally forage over open water in forested riparian areas, and may fly almost installation-wide. Typical flight distances from roosts to foraging areas may be 12 to 13 km; distances as great as 35 km (Tuttle 1976) and 70 km (Thomas and Best, in press) have been documented. Adult gray bats primarily feed on aquatic insects (Figure 25). They forage from dusk to dawn, resting intermittently, and return to roost caves. Additional information regarding the foraging habits of gray bats is provided in Section 3.2.4 of this appendix.

8.3.2.2 Roosting Gray Bats

Gray bats are found on the Installation for approximately 5 months (late April - early September) each year. Saltpeter No. 3 and Freeman caves are within several hundred meters of a waterway. Additional information describing gray bats in maternity roosts is provided in Section 3.2.3. Gray bats also have maternity roosts Great Spirit Cave, approximately 3 km west of the Installation.

Gray Bat Maternity Sites

We also assessed effects to gray bat in Saltpeter No. 3 and Freeman caves (Figure 26). We also assessed effects to gray bats in maternity roosts in Great Spirit Cave (Figure 26). No cave air flow model was developed for Great Spirit Cave. We assessed effects based on contaminant concentrations expected to reach the cave. Physical characteristics of caves can influence the behavior of stressors inside the caves. Stressors can persist or be rapidly removed from the cave atmosphere depending on the size and air flow dynamics of the cave. Table 17 provides physical descriptions for the caves on the installation.

The entrance to Saltpeter No. 3 Cave (3 m high and 28 m wide) faces east toward Roubidoux Creek. The large, domed entrance room (73 m long and 30 m wide) is used as a gray bat maternity site. Over 700 m of passage has been mapped beyond the entrance room. Gray bats roost in 3 areas beyond the entrance room during the maternity season.

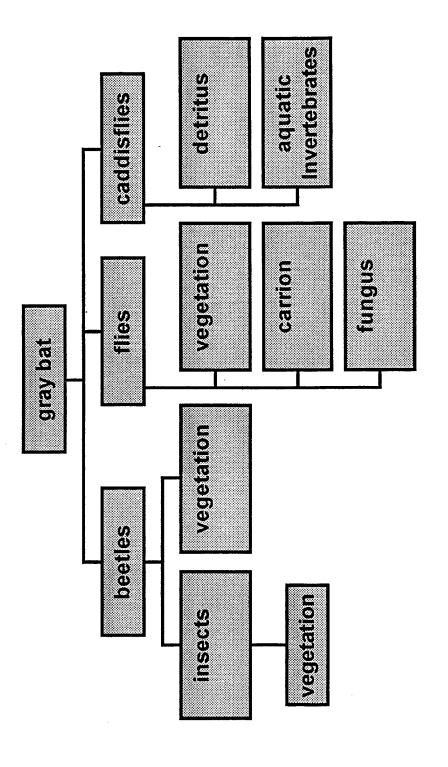
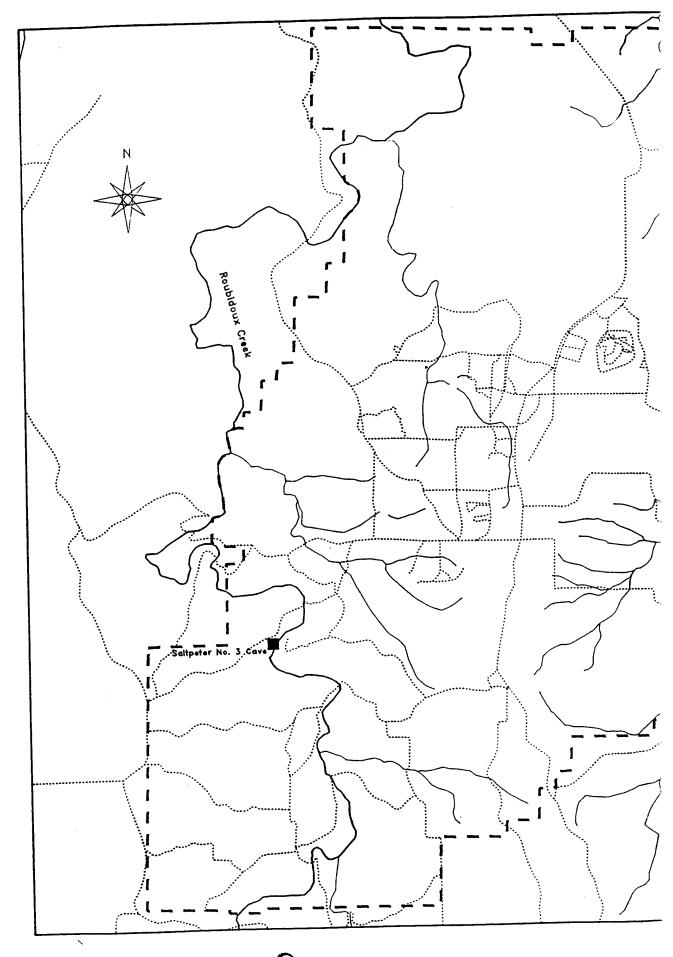
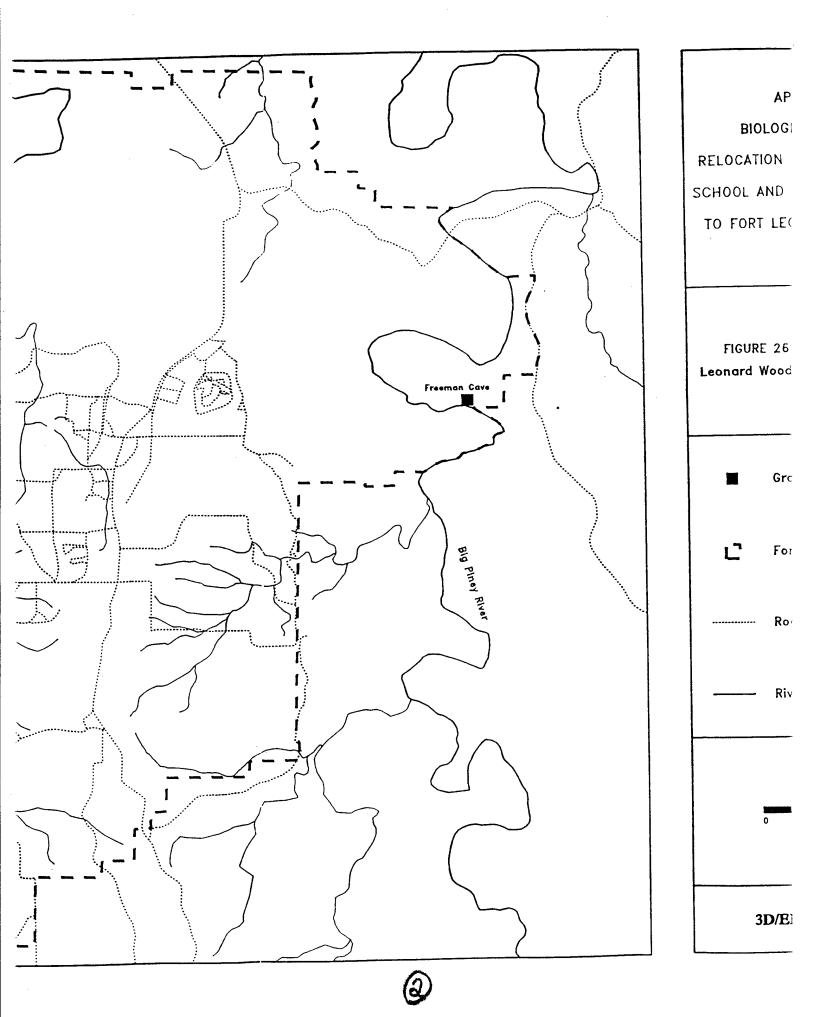
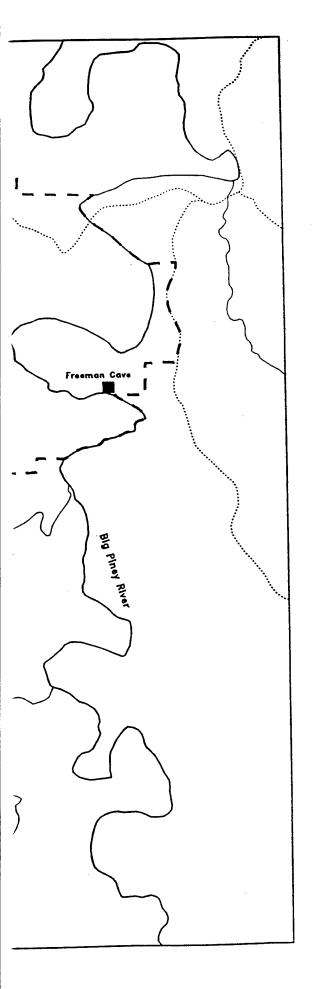


FIGURE 25. Food chain of gray bats at Fort Leonard Wood, Missouri.



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APPENDIX IV TO

BIOLOGICAL ASSESSMENT:

RELOCATION OF U.S. ARMY CHEMICAL SCHOOL AND MILITARY POLICE SCHOOL TO FORT LEONARD WOOD, MISSOURI

FIGURE 26. Gray bat caves at Fort Leonard Wood, Missouri.

- Gray Bat Cave
- Fort Leonard Wood Boundary

.....Road

___ River / Stream

Kilometers 2 4

TABLE 17. Dimensions of gray bat caves on Fort Leonard Wood.

1	Saltpeter No. 3	Freeman
Entrance area (ft²)	506	1103
Cave volume (ft³) Entrance area/cave volume	286,192 5.80E-05	53,463 6.77E-04

Freeman Cave has a south-facing entrance 12 m high and 15 m wide. The cave floor slopes upward which contributes to the cave trapping warm air. The passage quickly narrows as the floor rises to create a passage 2 m high and 2.5 m wide. Approximately 40 m into the cave is a dome room approximately 15 m high. Gray bats roost on the ceiling of this dome room. The dome may trap the warmest air entering the cave and provide conditions suitable for a gray bat maternity colony. An upper passage runs from the top of the dome toward the cave entrance. A lower passage continues from the bottom of the dome room for another 30 m. Gray bats are not known to use the upper or lower passages, but the passages likely influence cave air flow.

Air Flow at Gray Bat Caves

We collected meteorological data from Saltpeter No. 3 and Freeman caves as we did for Indiana bat hibernacula (see Section 8.3.1.3). Table 18 presents mixing constants and air flow model values for Saltpeter No. 3 and Freeman caves. Pasquill categories and the stressor concentration associated with each category are included in Tables 15 and 16.

8.3.3 Bald Eagles

Bald eagles may ingest, inhale, or absorb stressors while perching, foraging, roosting, and nesting (Figure 27). Bald eagles have the potential for direct exposure to chemical stressors or secondary exposure (exposure to chemical stressors through another source). Figure 27 presents an exposure pathways for bald eagles at Fort Leonard Wood.

8.3.3.1 Wintering Bald Eagles

Bald eagles winter at Fort Leonard Wood from approximately November 1 through March 15. Bald eagles may be exposed to chemical stressors while perched, or while foraging

TABLE 18. Information used to develop air flow models for gray bat caves on Fort Leonard Wood, Missouri.

Parameter	Saltpeter No. 3 Cave	Freeman Cave
Cave maximum temperature (K)	290	289
Cave minimum temperature (K)	258	282
Cave maximum pressure (mbar)	1002	1002
Cave minimum pressure (mbar)	959	959
Maximum computed air velocity (1 mbar dP, cm/s)	41.6280	41.5561
Minimum computed air velocity (1 mbar dP, cm/s)	38.4124	40.1593
Maximum flow rate/cave volume (1/s)	0.0024	0.0281
Minimum flow rate/cave volume (1/s)	0.0022	0.0271
Measured dispersion constant range (Q/KV)	0.0011-0.0007	0.0029-0.0018
Highest correlation dispersion constant	0.0007	0.0029
Maximum mixing constant (1/s)	3.4496	9.6993
Minimum mixing constant (1/s)	3.1831	9.3733

in the winter. Wintering bald eagles perch along Roubidoux Creek and the Big Piney River on the installation (Figure 28). Eagles roost at night in areas sheltered from extreme weather and human disturbance. Typical night roosts are in mature trees with heavy limbs and an open branching pattern. Wintering bald eagle roost trees are of various species, but are typically large and sheltered from prevailing winds. Bald eagles may change roost sites every 3 to 4 nights. Wintering eagles are not known to roost communally on the installation. No night roosts have been identified.

Bald eagles migrate to winter habitat in response to adverse weather conditions and limited food availability. Winter habitats typically are near readily available food resources. The diet of wintering bald eagles consists primarily of carrion, waterfowl, and dead or dying fish (Figure 29). The winter diet varies with the type of food most readily available. Winter foraging areas and diurnal foraging perches often are near streams, lakes, or other water bodies. Section 3.3.3 of this appendix provides a more detailed description of the life history of the species.

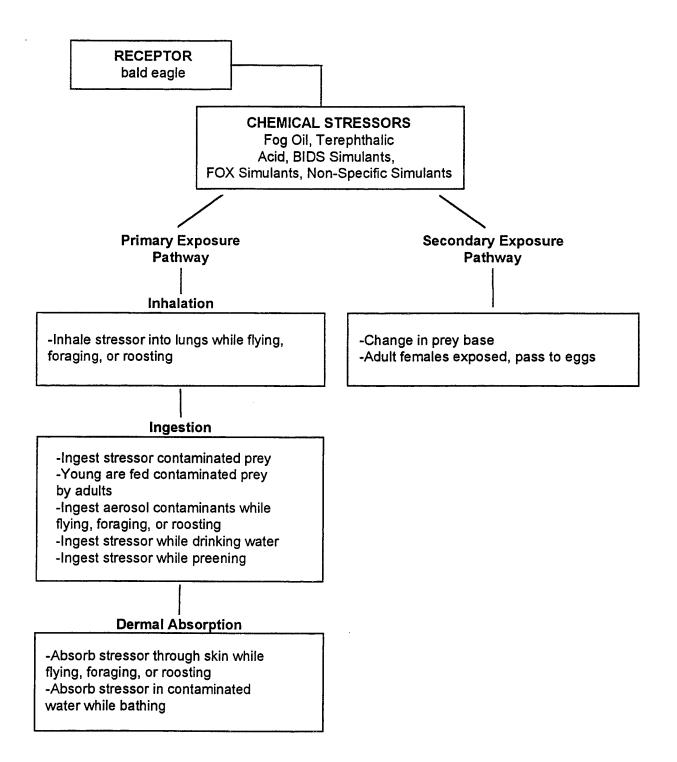
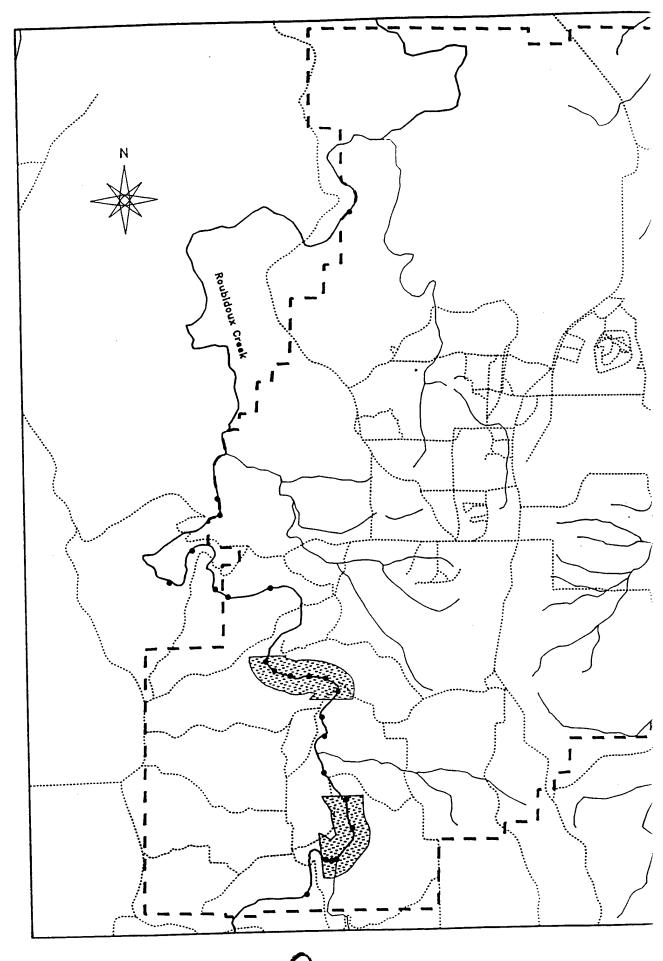
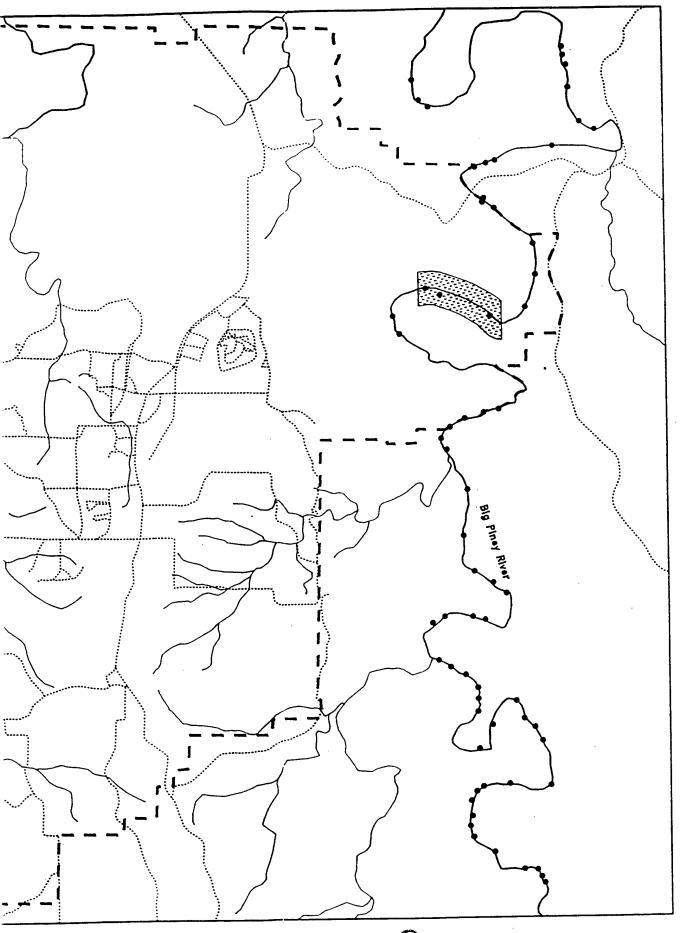


FIGURE 27. Pathways through which bald eagles may be exposed to stressors at Fort Leonard Wood.



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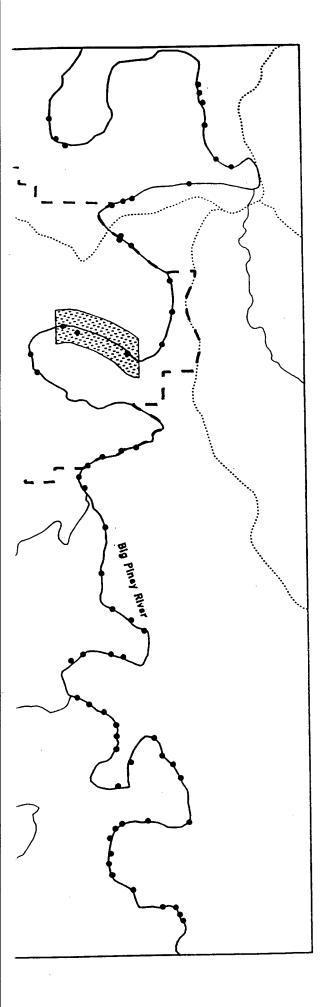
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RELOCATION OF U.S. ARMY CHEMICAL SCHOOL AND MILITARY POLICE SCHOOL TO FORT LEONARD WOOD, MISSOURI

FIGURE 28. Bald eagle sightings, and concentration areas in which 10 or more eagles have been sighted within a 2 Km stretch of Roubidoux Creek or Big Piney River between 1988 and 1995.

- Bald Eagle Sighting
- Bald Eagle Concentration Area
- Fort Leonard Wood Boundary

Road

- River / Stream

Kilometers
0 2 4

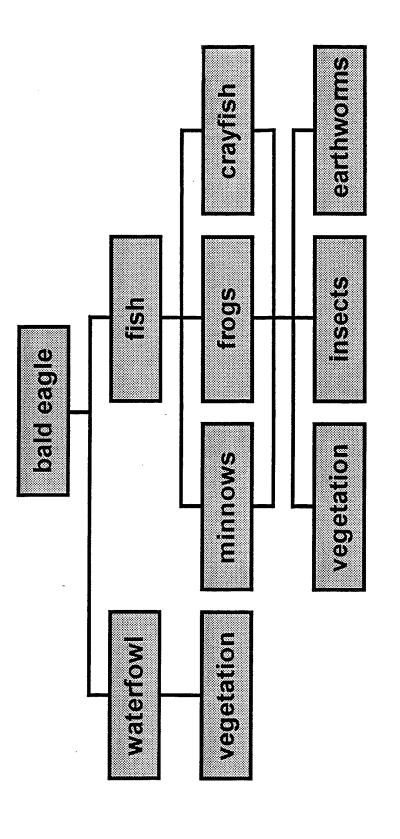


FIGURE 29. Food chain of bald eagles at Fort Leonard Wood, Missouri.

8.3.3.2 Nesting Bald Eagles

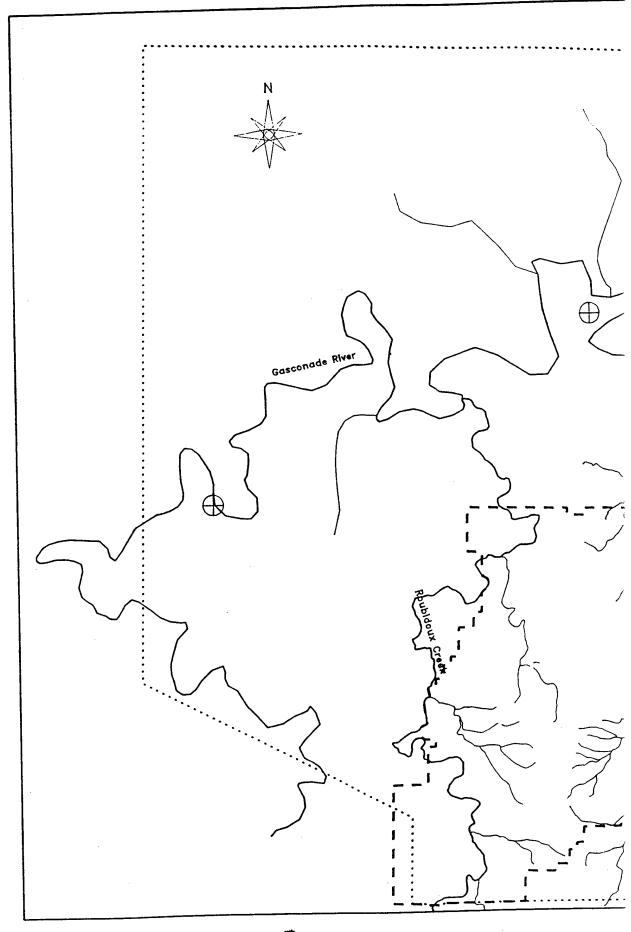
Bald eagles nest near Fort Leonard Wood. Three active nests are known along the Gasconade River near the installation (Figure 30), with the nearest nest 10.4 km from the installation boundary. Nesting bald eagles near the Installation feed largely upon fish, waterfowl, and carrion. The reproduction period of bald eagles varies with latitude. In Missouri, the onset of nesting behavior can be expected from January through early March. Nesting is not synchronized among sympatric eagles. The time period from the beginning of egg laying through juvenile independence can range from 164 - 214 days, and nesting eagles may be present near Fort Leonard Wood for much of the year. The average lifespan for bald eagles is 35 years.

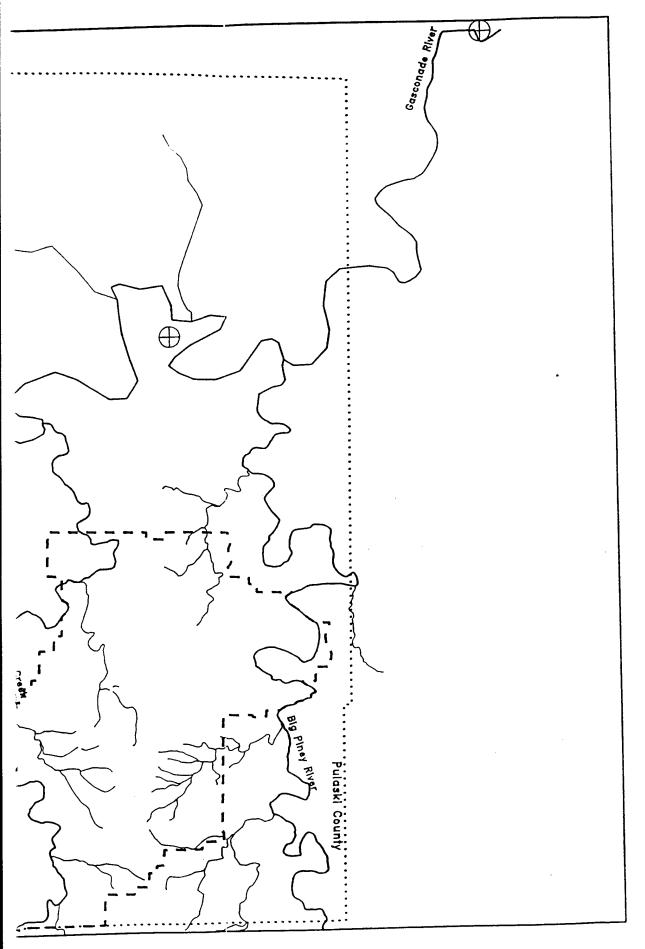
Nesting bald eagle occupy home range that average 321 acres along the Columbia River, with a maximum home range size of 1038 acres. Nesting eagles concentrate activity in high productivity foraging areas within the home range and may actively use only 6% of the total area (McGarigal et al. 1991). In Missouri, food resources may not be as plentiful as in along the Columbia River and nesting home range sizes may be larger. However, even allowing for larger home range sizes near the Installation, it is unlikely nesting eagles forage on Fort Leonard Wood.

8.4 QUANTIFYING EXPOSURE - INTAKE VALUES

The third step in an exposure assessment is to quantify the exposure of receptors to stressors. We first determined the stressor concentration at the exposure point, then estimated the intake of the stressor at the same location. We estimated how often the exposure will occur, and related this information to the receptor (e.g. receptor location, seasonal presence).

We calculated an acute and chronic intake. Chronic intake values relate the concentration of the stressor to the expected exposure frequency, averaged over the receptors life. Acute intakes were determined by the stressor concentration expected in a single training event. Chronic intakes were calculated by using a modified version of the generic equation from EPA RAGS Volume I, Part A, Human Health Evaluation Manual (1989). The generic equation incorporates information about the frequency and duration of use of the stressor as well as information about the receptor. The equation was designed for use in assessing





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FIGURE 30. $\,$ l nests near Fort L ϵ

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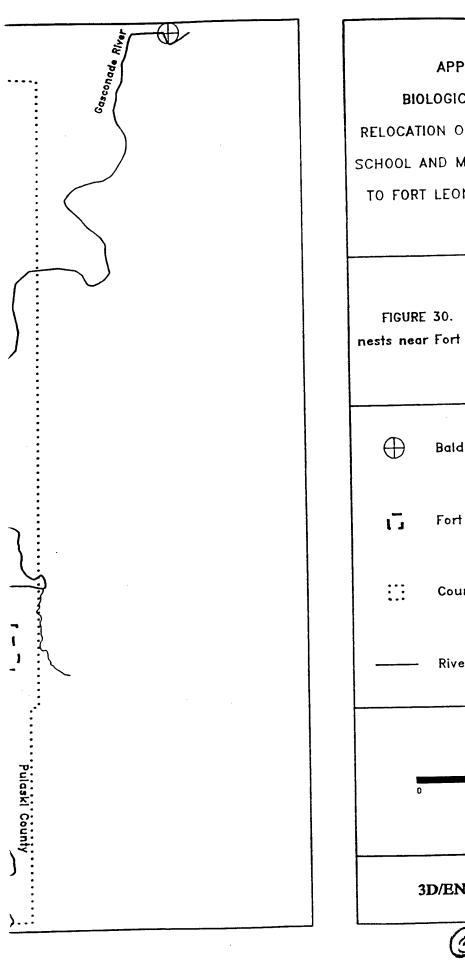
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APPENDIX IV TO

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FIGURE 30. Location of bald eagle nests near Fort Leonard Wood, Missouri.

- Bald Eagle Nest
- Fort Leonard Wood Boundary
- County Boundary
- River / Stream

Kilometers

exposure at Superfund sites. We modified the equation for our predictive ERA. The generic equation for calculating chemical intakes:

EPA (1989) generic intake equation

$$I = C (CR x \frac{EFD}{BW}) \frac{1}{AT}$$

where:

I = Intake the amount of chemical at the exchange boundary (mg/kg body weight-day) C = Chemical concentration; the average concentration contacted over the exposure period (e.g., mg/liter water)

CR = Contact rate; the amount of contaminated medium contacted per unit time or event (e.g., liters/day)

EFD = Exposure frequency and duration; describes how long and how often exposure occurs. Often calculated using two terms (EF x ED):

EF = Exposure frequency (days/years)

ED = Exposure duration (years)

BW = Body weight; the average weight over the exposure period (kg)

AT = Averaging time; period over which exposure is averaged (days)

We used the following equations to estimate inhalation, ingestion, and dermal intakes by receptor species (EPA 1989):

Inhalation Intake Equation (EPA 1989)

$$II = \frac{CA \, IR \, ET \, EF \, ED}{BW \, AT}$$

where:

// = Inhalation Intake (g/kg-day)

CA = Contaminant concentration in air (g/m³)

IR = Intake rate (m³/hour)

ET = Exposure time (hours/day)

EF = Exposure frequency (days/year)

ED = Exposure duration (years)

BW = Body weight (kg)

AT = Averaging time (lifespan of receptor in days)

Ingestion Intake Equation (EPA 1989)

$$II = \frac{CF IR EF ED}{BW AT}$$

where:

// = Ingestion intake (g/kg-day)

CF = Quantity of contaminant deposited on food item (g/g)

IR = Intake rate (g/day)

EF = Exposure frequency (days/year)

ED = Exposure duration (years)

BW = Body weight (kg)

AT = Averaging time (lifespan of receptor in days)

Dermal Absorption Intake Equation (EPA 1989)

$$DAI = \frac{CD SA ABS EF ED}{BWAT}$$

where:

DAI = Dermal Absorption Intake g/kg-day

CD = Quantity of contaminant deposited on receptor (g/m²)

SA = Surface area of receptor (m²)

ABS = Absorption factor (unitless), assumed equal to 1 (100% absorption)

EF = Exposure frequency (days/year)

ED = Exposure duration (years)

BW = Body weight (kg)

AT = Averaging time (lifespan of receptor in days)

The intake rate for inhalation was modified to reflect the actual exposure duration for each event.

Input values for each receptor intake calculations and Pasquill category are given in Attachments C, D, E, and J. Fog oil, TPA, and titanium dioxide intake tables showing intake parameters used to calculate chronic daily intake are presented. Tables are organized by receptor and Pasquill category.

We evaluated inhalation and ingestion routes of exposure for each receptor in the screening risk assessment. We assumed 100% absorption of chemical stressors in the screening ERA and the detailed ERA. This may be conservative because certain chemicals taken into the body or placed on the dermis may not entirely enter the blood stream or pass through the skin. Without specific absorption coefficients for each receptor and stressor, we assessed the entire exposure concentration as the dose in intake calculations. In the

screening risk assessment, calculated intakes were compared to the selected toxicity values to determine if receptors would be exposed to unsafe concentrations of stressors. Only exposure concentrations of fog oil, TPA, and titanium dioxide are expected to exceed safe levels.

The screening risk assessment also involved estimating intakes of chemical stressors with a complete pathway to receptors. We determined there were 3 chemicals of potential concern: fog oil, terephthalic acid (TPA), and titanium dioxide. We calculated a chronic intake based on projected use. We estimated concentrations calculated for one field training exercise for the acute exposure concentration value. We multiplied the single-event concentration by the anticipated number of events per year to calculate the chronic exposure.

8.4.1 Stressor Concentrations

The concentration of each stressor was determined based on estimated quantities, expected release rate, and intended use. Predicted concentrations are based on the best available information, or modeled estimates. We consistently used "worst case" to define parameters related to stressor concentration. We used the best available information to estimate exposure scenarios and daily quantities.

Fog oil and TPA smokes are released into the atmosphere and disperse into the environment. Many exposure points are possible. Titanium dioxide is released in tiny particles that block infrared radiation. Dispersion of this stressor is relatively limited. To accurately determine stressor concentrations at exposure points, we adjusted exposure duration of fog oil, TPA, and titanium dioxide. We incorporated the concentration of the NOAEL or TRV in the cave air flow model and determined how long stressor concentrations would remain above safe levels in each hibernacula or maternity cave (NOAEL or TRV) (Tables 15 and 16).

We also assessed effects of chemical stressors to receptors that may occur widely on the installation (e.g. foraging Indiana bats, foraging gray bats, and bald eagles). Stressor concentrations at these exposure sites were measured from isopleths.

Threshold values describe the maximum exposure concentrations that do not affect receptors. We calculated threshold values for fog oil, TPA grenades, TPA smoke pots, and titanium dioxide grenades. Threshold values were determined for each receptor and exposure pathway (Attachment I).

8.4.1.1 Fog Oil

Static fog oil training will be conducted only at Range 30F (Figure 5). There will be 20 stationary generators running at a release rate of 0.66 gallons per minute. The expected daily maximum consumption of fog oil (static or mobile) is 1200 gallons. The yearly static training requirement is 8500 gallons. Mobile smoke training will occur at 4 areas (Section 4.1.7). A maximum of 12 generators will be used simultaneously in mobile smoke training. Our analysis was based on a percentage of 76,000 gallons of fog oil being released on mobile smoke training areas: Ballard Hollow (20%), Cannon Range (Mush Paddle Hollow) (25%), Musgrave Hollow (40%), and Bailey McCann Hollow (30%). We assessed effects to foraging/roosting Indiana bats, foraging gray bats, and traveling bald eagles assuming 42,200 gallons of fog oil will be deployed at any of the mobile smoke training areas.

Static and mobile training may occur on the same day (not at the same time), but for this analysis, we assumed they would not. This approach allows evaluation of a scenario where the maximum daily fog oil quantity (1200 gallons) would be used by either mobile or static training. The smoke from 32 generators (20 static plus 12 mobile) will not operate simultaneously at the same location. We considered 20 generators consuming 1200 gallons of fog oil a day.

We used the TREMS1 air dispersion model to calculate dispersion of fog oil. We performed a comparative analysis to determine which of 3 air dispersion models would give the highest concentrations at the greatest distance under identical meteorological conditions. A discussion paper has been prepared which explains the rationale used to select the TREMS1 model. TREMS1 is described in detail in the Ongoing Mission BA (3D/Environmental 1996). A deposition velocity was added to the model to create deposition isopleths that calculate the amount of fog oil to be deposited downwind of the generators.

We modeled dispersion and deposition of stressors for Pasquill atmospheric stability categories B, C, D, and E. We varied sample heights and wind speeds on concentration and deposition plots for static and mobile training. Figures 14, 15, 16, and 17 are concentration isopleths for static smoke (20 generators). Figures 18, 19, 20, and 21 are concentration isopleths for mobile smoke training (12 generators). Figure 22 describes deposition from fog oil static training under Pasquill category E. Figure 23 depicts deposition from fog oil mobile

smoke training under Pasquill E. Additional deposition isopleths are presented in Attachment B.

After concentrations of stressors reaching Indiana bat hibernacula and gray bat maternity caves were determined, we calculated the time over which stressor concentrations would reach equilibrium in the caves. We then calculated the time during which stressor concentrations would exceed safe concentrations (above a TRV). We incorporated the amount of time a stressor would remain above safe concentrations into intake calculations. We adjusted the inhalation rate of bats in caves to reflect the amount of time predicted fog oil concentration remains above safe levels.

8.4.1.2 Terephthalic Acid

We assessed the effect of the maximum number of TPA grenades and smoke pots being released one at a time to determine the concentration of TPA at expected exposure points. Both grenades and smoke pots have short burn times (2.5 minutes). We used TREMS1 to estimate dispersion of TPA. We modeled the dispersion under Pasquill categories B, C, D, and E for both TPA grenades and smoke pots. With TREMS 1, we modeled the dispersion of TPA (fog oil, and titanium dioxide) downwind of sources based upon 3 m/second wind speed and 3 m sample height. Pasquill B showed the greatest dispersion of both forms of TPA, therefore we only present and describe effects for Pasquill B (Figures 31 and 32). All modeled dispersion isopleths for TPA (grenades and smoke pots) were very similar for each Pasquill category. TPA does not disperse very far from the source under any Pasquill category.

TPA grenades will be used at 22 locations and TPA smoke pots will be used at 5 locations (Figure 32) and 4 mobile fog oil smoke training areas (Figure 5) on the installation. We measured TPA concentrations at each of the 31 locations and used these as exposure concentrations. Distances were measured from each of the 31 TPA smoke training areas to locations particularly sensitive to exposure (e.g. Indiana bat hibernacula). Exposure concentrations were based on distances from smoke training areas to exposure points. We determined concentrations at the described distance from concentration isopleths (Figures 31 and 32). Exposure concentrations for receptors that could occur widely on the Installation (e.g.

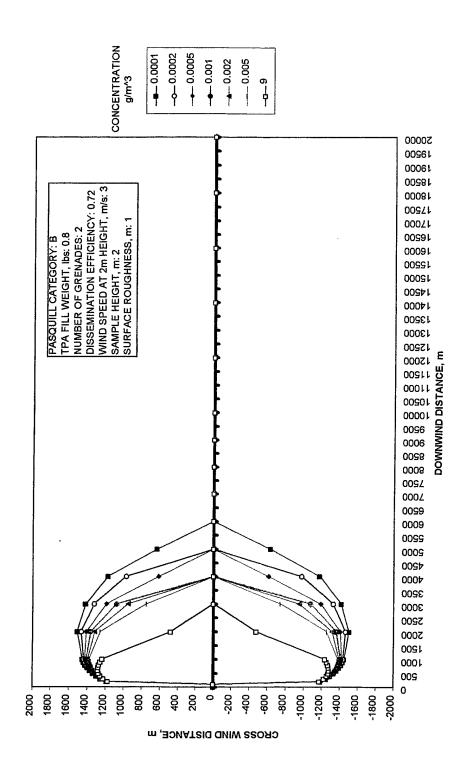


FIGURE 31. Concentration of terephthalic acid from smoke grenades (Pasquill B) at varying distances from smoke grenade training locations.

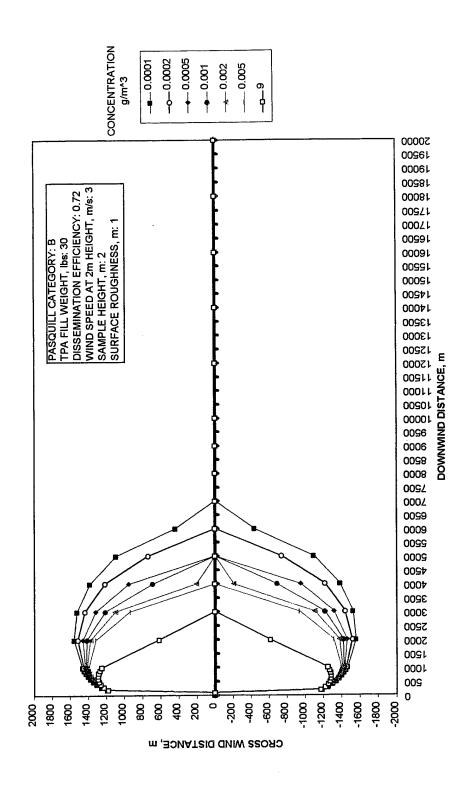


FIGURE 32. Concentration of terephthalic acid from smoke pots (Pasquill B) at varying distances from smoke pot training

foraging Indiana bats) were measured at the source at each of the TPA smoke training areas. We assumed receptors could forage anywhere in any of the 31 TPA smoke training locations.

We used the following assumptions when calculating the exposure of receptors to TPA smoke grenades (Emily Brown, Fort Leonard Wood, pers. comm.):

- 131 training days per year
- 3136 TPA grenades maximum per year
- 2242 grenades from 1 November through 15 March (93 training days)
- 141 grenades maximum used daily at any combination of the 22 training locations
- 24 grenades maximum per day from any one training location
- 2.5 minute burn time

We used the following assumptions in our calculations of exposure of receptors to TPA smoke pots (Emily Brown, Fort Leonard Wood, pers. comm.):

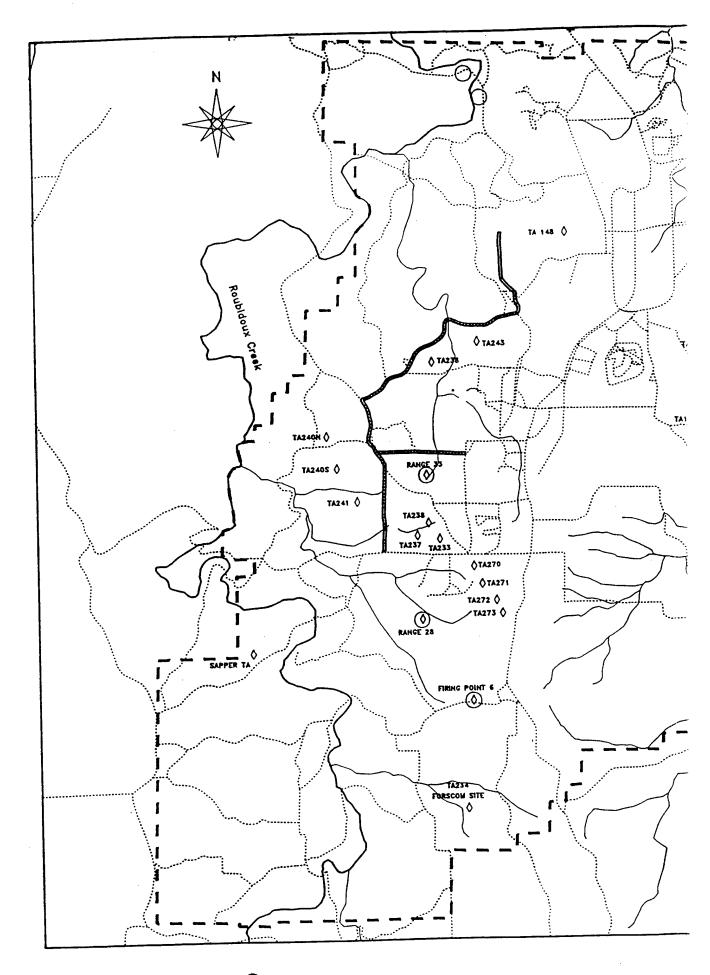
- 16 training days per year
- 950 TPA smoke pots maximum per year
- 59 smoke pots maximum used daily from any of the 22 training locations
- 2.5 minute burn time

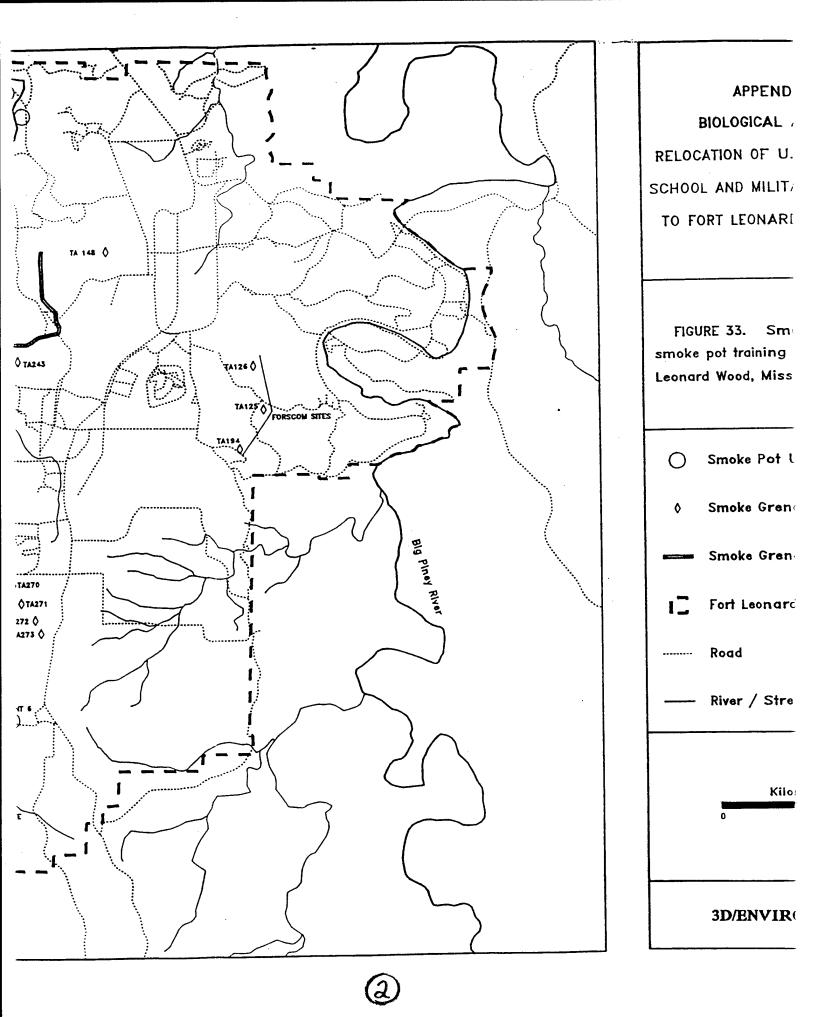
We evaluated inhalation, but not ingestion or dermal absorption. Because burn times are short for grenades and smoke pots, and components of the smoke are gases, complete ingestion and dermal absorption pathways do not exist.

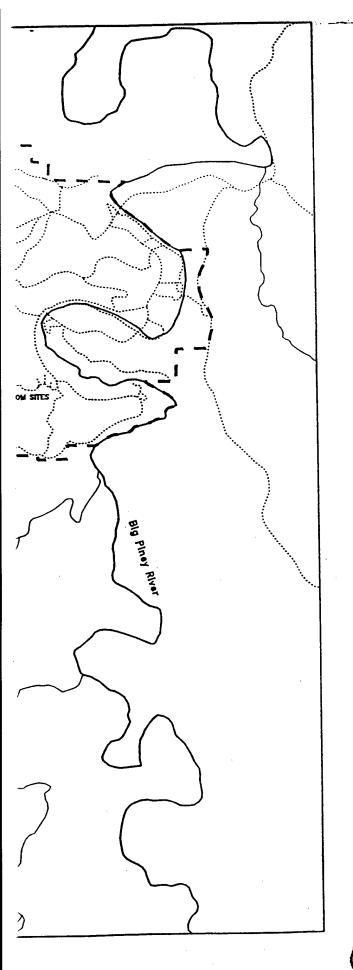
8.4.1.3 Titanium Dioxide

Titanium dioxide will be released from M82 grenades at Fort Leonard Wood at the 22 smoke grenade training locations (Figure 33). We estimated concentrations of titanium dioxide in the atmosphere after a release (Figure 34). We modeled the dispersion of titanium dioxide under Pasquill categories B, C, D, and E. For the conditions we assessed, Pasquill category E created the greatest dispersion of titanium dioxide. The dispersion of titanium dioxide does not disperse very far from the source under any Pasquill category.

We evaluated effects of titanium dioxide only for inhalation. Based on the relatively short burn time (less than 2.5 minutes) and the type of material that is released, complete ingestion and dermal absorption exposure routes do not exist.







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FIGURE 33. Smoke grenade and smoke pot training locations for Fort Leonard Wood, Missouri.

- Smoke Pot Use Area
- ♦ Smoke Grenade Use Area
- Smoke Grenade Training Road
- Fort Leonard Wood Boundary
- -----Road
- --- River / Stream

Kilometers 0 2 4

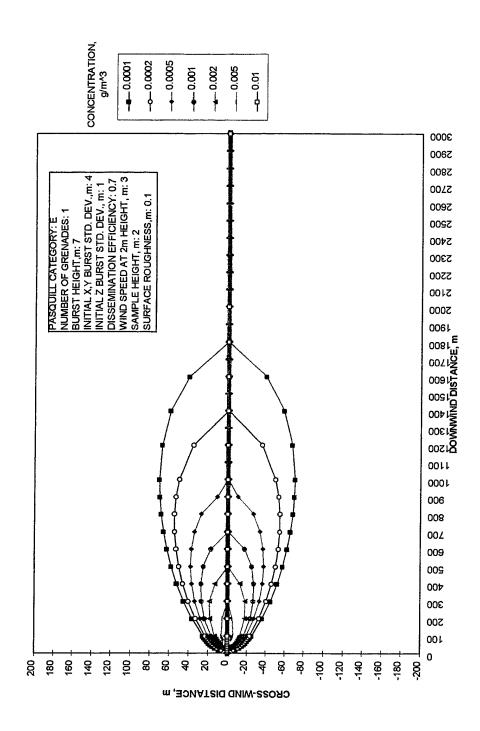


FIGURE 34. Concentration of titanium dioxide from grenades (Pasquill E) at varying distances from grenade training

We estimated titanium dioxide intakes using the following assumptions (Emily Brown, Fort Leonard Wood, pers. comm.):

- 48 grenades per year
- 24 grenades per day from any training location
- 2 training days per year
- 2.5 minute burn time

8.4.2 Receptor Parameters for Intake Calculations

We incorporated specific physiological and life history data for each receptor in calculations of chronic intake. Calculations of inhalation involved only the inhalation rates of receptors. Calculations of dermal absorption for fog oil required assessment of receptor surface area. Analysis of intake via ingestion for fog oil were based upon surface area of prey species. Complete dermal absorption and ingestion pathways do not exist for TPA and titanium dioxide.

In calculating ingestion of fog oil, we assumed prey consumed by receptors were coated with fog oil. We determined the amount of fog oil that would cover food within areas defined by each deposition isopleth. We selected prey and food items representing average prey or food consumed by each receptor species. Assumptions regarding diets and calculations of prey surface areas for each receptor species are described in Section XI.

We addressed certain stages of each receptors life cycle that may be considered more sensitive than the adult stage. Specific receptor values used in these sensitive life cycle stages intake and risk calculations are presented in the following sections for each receptor.

8.4.2.1 Indiana Bats

Intake calculations for Indiana bats were based upon information provided in Table 19.

We adjusted the inhalation rate in our intake equation for hibernating and foraging Indiana bats to reflect the amount of time stressors will remain at the exposure concentrations. The duration of static fog oil training is 1.5 hours, mobile training will last 2.5 hours. We assumed the duration of TPA and titanium dioxide training events will be 2.5 minutes.

TABLE 19. Characteristics of Indiana bats used in intake equations.

Factor	Mean
Lifespan	7 years
Duration of hibernation	7 months
Body weight while hibernating	6 grams
Duration of foraging period	6 months
Inhalation rate	3.4E-4 m³/day
Ingestion rate	2.5 grams per day
Surface area of prey	3.3E-5 m ² per day
Surface area of adult Indiana bat	.022 m ²
Body weight while foraging	8 grams
Nursing pup weight (18 days old)	6 grams
Supplemental nursing pup (27 days old)	7 grams

Post-lactating female Indiana bats have been captured on Fort Leonard Wood. One or more nursery colonies may exist on, or near the installation. Because nursing Indiana bats may be more sensitive to chemical stressors (based on their reduced body weight and high metabolic rate), we assessed effects to nursing pups and supplemental nursing pups (pups that forage and nurse). Based upon information available for a closely related species, the little brown bat, Indiana bat pups likely nurse exclusively until they are about 18 days old (Kurta et al. 1989). Supplemental nursing occurs from about 18 days until the pups are approximately 27 days old. Exposure points for nursing and supplemental nursing pups were the same as adult foraging and roosting locations.

8.4.2.2 Gray Bats

Intake calculations for gray bats were based upon information provided in Table 20.

We adjusted the inhalation rate in our intake equation for gray bats in maternity colonies and foraging gray bats to reflect the amount of time stressors will remain at the exposure concentration.

We assessed effects to nursing gray bat pups because they may be more sensitive to chemical stressors (based on their reduced body weight and high metabolic rate). We assessed effects to nursing pups and supplemental nursing pups (pups that forage and nurse). Gray bat pups nurse exclusively until they are about 20 days old. Supplemental

TABLE 20. Characteristics of gray bats used in intake equations.

Factor	Mean	
Lifespan	10 years	
Duration of summer foraging period	6 months	
Duration of summer roosting period	8 months	
Body weight adult	10.5 grams	
Inhalation rate	3.4E-4 m ³ /day	
Ingestion rate	2.5 grams / day	
Surface area of prey	3.3E-5 m² / day	
Surface area of adult gray bat	.026 m ²	
Body weight while foraging	8 grams	
Nursing pup weight (20 days old)	5.4 grams	
Supplemental nursing pup (45 days old)	7.1 grams	

nursing occurs from about 20 days until the pups are 40 to 50 days old (LaVal and LaVal 1980). Exposure points for nursing and supplemental nursing pups were the same as adult foraging and roosting locations.

8.4.2.3 Bald Eagles

Intake calculations for bald eagle were based upon information provided in Table 21. We adjusted the inhalation rate in our intake equation for foraging and nesting bald eagles to reflect the amount of time stressors will remain at the exposure concentration.

TABLE 21. Characteristics of bald eagles used in intake equations.

Factor	Mean	
Lifespan	35 years	
Duration of summer period	5 months	
Duration of winter period	7 months	
Body weight of adult and juvenile	4.5 kilograms	
Surface area of adult and juvenile	$0.275 \mathrm{m}^2$	
Ingestion rate of adult and juvenile	0.2925 kg/day	
Inhalation rate of adult and juvenile	1.31 m³/day	
Inhalation rate of hatchling	0.24 m³/day	
Body weight of egg (35 days old)	120 grams	
Body weight of hatchling (10 days old)	500 grams	
Surface area of egg	108.31 cm ²	

We used life history information for a 10-day old neonate to assess effects to hatchlings. Juvenile eagles are physiologically and morphologically similar to adults, but are sexually immature. We evaluated effects of fog oil to bald eagle eggs by the dermal pathway, effects to bald eagle hatchlings by the inhalation pathway, and bald eagle juveniles by ingestion, inhalation, and dermal absorption pathways.

Section 9 Risk Characterization and Discussion

Section IX:
Risk Characterization and Discussion

9.1 INTRODUCTION

Characterizing risk incurred by receptors as a result of their association with stressors involves integrating toxicological information and values developed in the toxicity assessment with intake values determined in the exposure assessment. This integration approach is recognized and acceptable for human health risk assessments and is applied here to estimate effects to non-human receptors (EPA 1995). Risks are characterized to identify stressors that will be toxic to adult and other life cycle stages of receptors.

Acute and chronic unsafe stressor concentrations are established in the toxicity assessment. We developed TRVs (toxicity reference values) for each receptor and route of exposure. TRVs are based on a NOAEL or LOAEL, or an effects level, such as LD₅₀. Acute toxicity values from tests where stressors were administered in single doses, were selected for the acute toxicity values in this study. Chronic toxicity values used in this study were selected from studies where the stressor was administered in multiple doses over an extended period of time. TRVs were developed for each receptor by applying Uncertainty Factors (UFs) to toxicity values generated for other species. The application of UFs accounts for sensitive life cycle stages of the Indiana bat, gray bat, and bald eagle. Because TRVs are reduced by several UFs, the reduction should account for different sensitivities of test species and receptors, including sensitive life cycle stages.

Exposure concentrations were determined by modeling dispersion and deposition of fog oil, TPA, and titanium dioxide in various atmospheric stabilities (Pasquill categories). We used exposure concentrations to estimate the amount of fog oil, TPA, and titanium dioxide receptors would intake. Adult receptor intakes were calculated for inhalation, ingestion, and dermal absorption pathways for fog oil, and for the inhalation pathway for TPA and titanium dioxide. Intake values calculated for sensitive life cycle stages were based on the Pasquill categories where the greatest downwind dispersion was estimated for each stressor (Pasquill category E for fog oil, Pasquill category B for TPA, and Pasquill category E for titanium dioxide).

We evaluated effects of fog oil, TPA, and titanium dioxide inhalation by Indiana bats and gray bats adults, nursing pups, and supplemental nursing pups. We concluded pups would not be affected by ingesting contaminated prey based upon our analysis of the same topic for adult bats. We did not examine the effect of bat pups receiving stressor doses on their skin because there we found no effects for adults, which have a larger surface area for dermal absorption. We assessed effects to four bald eagle life stages: eggs, hatchlings, juveniles, and adults. We evaluated effects from fog oil to bald eagle eggs via dermal exposure, bald eagle hatchlings via inhalation, and juveniles and adults by ingestion, inhalation, and dermal absorption. TPA and titanium dioxide have incomplete pathways to Indiana bats, gray bats, and bald eagles through dermal absorption and ingestion.

We adjusted EPA (1989) intake equations to reflect receptors being chronically exposed to fog oil, TPA, and titanium dioxide at Fort Leonard Wood. Acute intake values were based on concentration and deposition isopleths. We did not use chronic exposure intake equations to estimate acute effects. We assessed acute effects based upon the highest one-time contaminant exposure predicted. Attachments C, D, E, and J present intake tables for receptors, including sensitive life stages. We calculated the total amount of stressors that would reach receptors skin, that would occur on receptor's food, and that receptors would inhale. We used these amounts as estimates for exposure concentrations.

We developed an acute and chronic Hazard Quotient (HQ) for each receptor and each pathway based on modeled fog oil dispersion in Pasquill categories B, C, D, and E, modeled TPA dispersion under Pasquill category B, and titanium dioxide under Pasquill category E. Acute and chronic HQs were determined as follows:

HQ_{acute} = Exposure Concentration ÷ TRV_{acute}

HQ_{chronic} = Chronic Daily Intake ÷ TRV_{chronic}

When the hazard quotient is used to characterize non-carcinogenic effects, it provides a tool to realistically compare exposure concentrations to unsafe (toxic) concentrations. Hazard quotients are simple tools that provide point estimates relating presumed exposure concentrations to known or extrapolated effects levels of toxicants (Wentsel et al. 1994).

Risk characterization tables are presented in Attachments F, G, and H for adults of each species. Appendix J presents risk characterization tables for sensitive life stages. Each table indicates the distance from the source the concentration or deposition isopleth extends, chronic daily intakes, acute exposure concentrations, acute and chronic TRVs, uncertainty adjustments, acute and chronic critical studies, acute and chronic critical effects, acute and chronic HQs, and an effect determination. Tables are organized by species and Pasquill category for the adults.

Toxicological studies that generated toxicity values utilized in this ecological risk assessment also describe the effects of experimental exposures to test subjects. These effects are typically referred to as "critical effects." Because no, or limited, data is available describing effects likely to be manifested in Indiana bats, gray bats, and bald eagles, we assume effects will be similar to critical effects reported in the literature. Specifically:

Inhalation of Fog Oil

acute effect: oil pneumonia chronic effects: minor lesions of the heart, liver, and lungs

Ingestion of Fog Oil

acute effects: weight loss; lesions of the liver, spleen, and kidney chronic effect: gastrointestinal irritation

Dermal Absorption of Fog Oil

acute effect: slight to moderate skin irritation chronic effects: well defined erythema and edema

Inhalation of Terephthalic Acid

acute effect: necrosis and inflammation of the nasal cavity

chronic effect: edema of lungs and emphysema

Inhalation of Titanium Dioxide

acute effect: respiratory irritation

chronic effect: respiratory irritation

Acute and chronic effects (HQs > 1) are discussed in the following sections. Effects are determined and a brief discussion is presented. We discuss effects based on conditions and assumptions defined in our assessment. If all conditions are not met and a receptor is exposed to the stressor, the effect may or may not occur as described. Acute effects result from single exposure events. Chronic effects result from exposures averaged over the receptor's life span. The term "repeated" is used to define chronic exposures.

We describe direct effects in this section. Direct effects result when the receptor has immediate or intimate contact with the stressor. Indirect effects are caused when stressors reach receptors through a media or transport mechanism. For example, indirect effects may include transfer of contaminant from a lactating bat to a nursing pup through the milk. Indirect effects can cause behavioral changes that affect the individual's ability to survive, avoid predators, mate, reproduce, or obtain food. Indirect effects may occur when prey species populations are modified.

Indirect effects are not expected to result to Indiana bats, gray bats, or bald eagles on Fort Leonard Wood as a result of the BRAC Action. There is little information about the toxicological effects or ecological effects from of stressors evaluated in this ERA. No information exists to predict changes in receptor populations based upon changes in prey populations. Measurement endpoints to characterize indirect effects, including indirect effects to receptor *populations*, are not available. Inferences can be made by examining past studies or studies on similar receptors and stressors.

Data collected at Fort McClellan, Alabama by 3D/l did not indicate major differences in insect populations between fog oil exposure sites and a reference site. The study did not reveal statistically significant differences in concentrations of fog oil hydrocarbons in insect, vegetation, fish, or bat tissues from exposure sites and the reference site. Soil, surface water,

air, and sediment samples did not show fog oil accumulated in the environment. Based on this information, fog oil is not expected to affect prey populations because it does not remain in the environment, and does not bioaccumulate in biota.

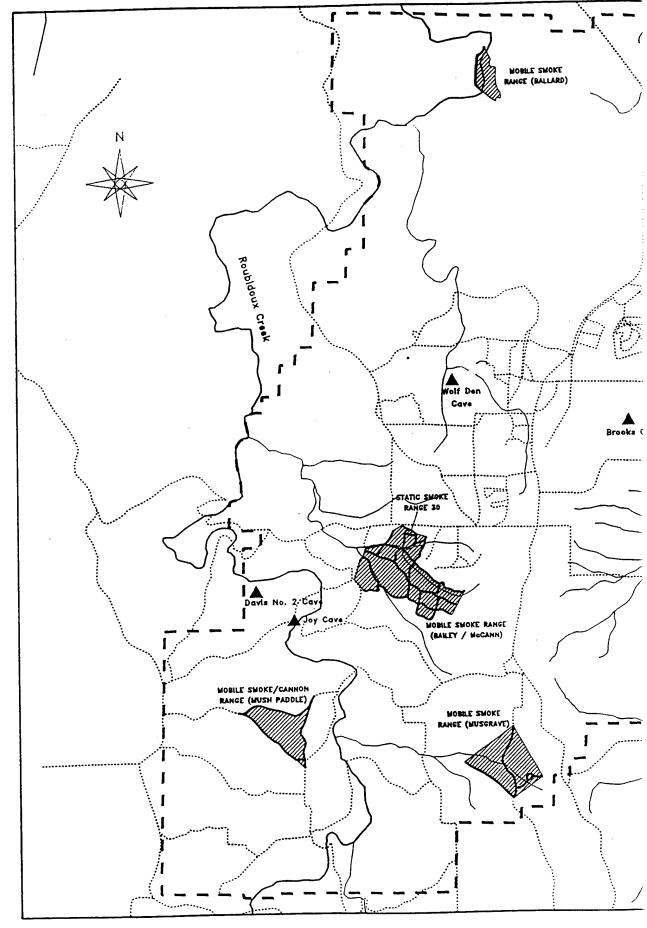
While fog oil is not expected to indirectly affect Indiana bats, gray bats, or bald eagles, there are several other chemical stressors with potential to cause indirect effects. Certain of these chemical stressors will be used only within enclosures (buildings) or released in such a manner that they will not reach receptors (Table 12). These chemical stressors will not cause direct or indirect effects. Other chemical stressors will be used only in minute quantities (relative to toxicity) or are non-toxic (see Section 8.2.2). The expendable training materials (Attachment A), terephthalic acid grenades, terephthalic acid smoke pots, and titanium dioxide may potentially cause indirect effects. No data exist to predict or evaluate these potential indirect effects with any reasonable certainty.

To detect changes that may indirectly effect receptors, Fort Leonard Wood will implement a biomonitoring program. The program will monitor water quality, media toxicity, certain insect populations, selected fish populations, vegetation, and the populations of Indiana bats, gray bats, and bald eagles on the installation. The program will detect changes in parameters listed above between exposure sites and reference sites. While natural variability in monitored parameters will preclude certain strict statistical evaluations of differences between exposure and reference sites, Fort Leonard Wood will employ a weight of evidence approach to indicate some change.

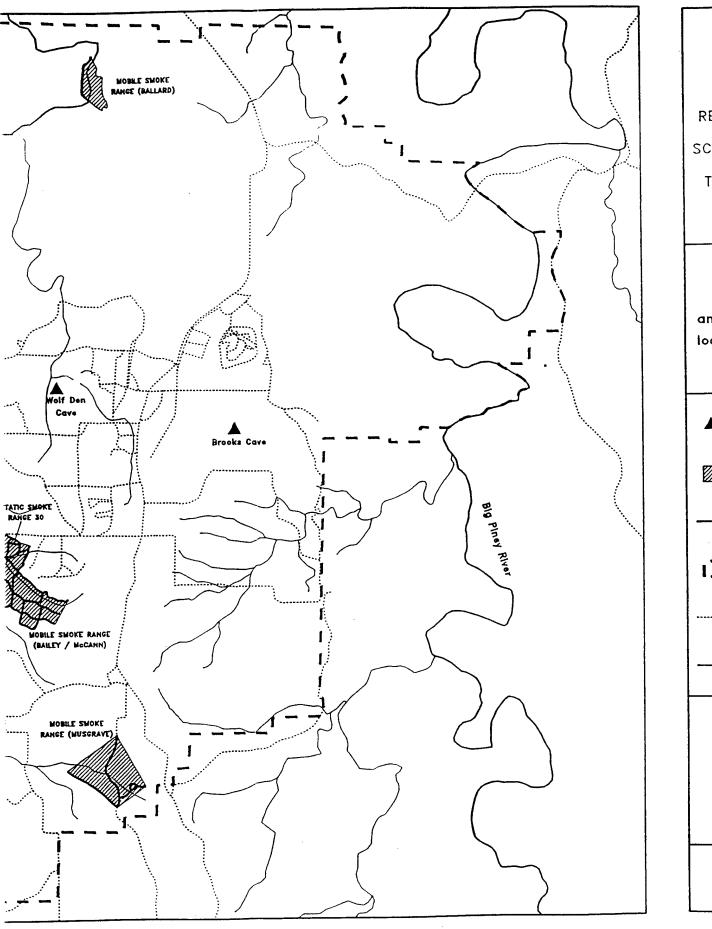
9.2 RISK OF EXPOSURE TO FOG OIL FROM STATIC AND MOBILE TRAINING

9.2.1 Indiana Bats

Indiana bats at Fort Leonard Wood will be affected by static and mobile fog oil training. We assessed effects from exposure to static and mobile fog oil training to foraging (installation-wide), roosting (installation-wide) and hibernating (hibernacula) Indiana bats (Figure 35). We assumed exposure to Indiana bat nursing-pups and supplemental nursing pups could occur at the same locations as foraging and roosting adults. Distances from Indiana bat hibernacula to fog oil smoke training locations are provided in Table 22.







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FIGURE 3: and propose locations at

▲ Indian

Offroc Range

---- Mobile

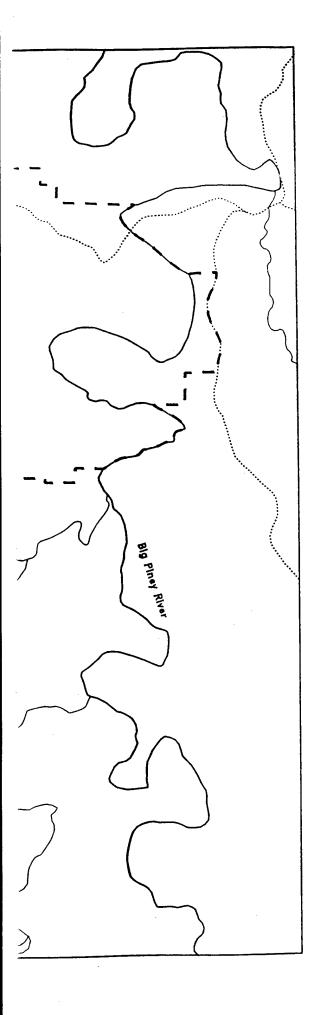
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---- Road

--- River

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APPENDIX IV TO BIOLOGICAL ASSESSMENT:

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FIGURE 35. Indiana bat hibernacula and proposed fog oil smoke training locations at Fort Leonard Wood, Missouri.

- ▲ Indiana Bat Cave
- Offroad Mobile Smoke Training
 Range
- --- Mobile Smoke Deployment Road
- Fort Leonard Wood Boundary
- ----- Road
- --- River / Stream

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TABLE 22. Distances from static and mobile smoke training areas to Indiana bat hibernacula.

Cave	Fog Oil Smoke Training Location	Distance (m)
Brooks	Static Smoke TA at 30F	6037
Brooks	Mobile Smoke TA at Musgrave Hollow	8031
Brooks	Mobile Smoke TA at Cannon Range (Mush Paddle Hollow)	10,335
Brooks	Mobile Smoke TA at Bailey/McCann Hollow	5803
Brooks	Mobile Smoke TA at Ballard Hollow	8449
Davis No. 2	Static Smoke TA at 30F	3927
Davis No. 2	Mobile Smoke TA at Musgrave Hollow	6624
Davis No. 2	Mobile Smoke TA at Cannon Range (Mush Paddle Hollow)	2889
Davis No. 2	Mobile Smoke TA at Bailey/McCann Hollow	2423
Davis No. 2	Mobile Smoke TA at Ballard Hollow	13,352
Wolf Den	Static Smoke TA at 30F	3878
Wolf Den	Mobile Smoke TA at Musgrave Hollow	8609
Wolf Den	Mobile Smoke TA at Cannon Range (Mush Paddle Hollow)	8432
Wolf Den	Mobile Smoke TA at Bailey/McCann Hollow	3861
Wolf Den	Mobile Smoke TA at Ballard Hollow	6859
Great Spirit	Static Smoke TA at 30F	9524
Great Spirit	Mobile Smoke TA at Musgrave Hollow	14,973
Great Spirit	Mobile Smoke TA at Cannon Range (Mush Paddle Hollow)	12,357
Great Spirit	Mobile Smoke TA at Bailey/McCann Hollow	9307
Great Spirit	Mobile Smoke TA at Ballard Hollow	7430
Jóy	Static Smoke TA at 30F	3682
Joy	Mobile Smoke TA at Musgrave Hollow	5499
Joy	Mobile Smoke TA at Cannon Range (Mush Paddle Hollow)	1803
Joy	Mobile Smoke TA at Bailey/McCann Hollow	2045
Joy	Mobile Smoke TA at Ballard Hollow	13,821

9.2.1.1 Inhalation

Static Training

Indiana bats will inhale unsafe doses of fog oil from static fog oil training while foraging, roosting, and hibernating.

 No acute inhalation effects to foraging, roosting or hibernating Indiana bats are expected.

- No acute or chronic inhalation effects to nursing or supplemental nursing Indiana bat pups are expected.
- Indiana bats repeatedly foraging or roosting within 4000 m of static fog oil smoke training will be exposed to unsafe concentrations of fog oil, and exhibit chronic inhalation effects.
- Indiana bats hibernating in Davis No. 2 Cave will inhale concentrations of fog oil released from static fog oil training areas that will result in chronic inhalation effects.

Mobile Training

Indiana bats will inhale unsafe doses of fog oil from mobile fog oil training while foraging, roosting, and hibernating.

- No acute inhalation effects to foraging, roosting or hibernating Indiana bats are expected.
- No acute or chronic inhalation effects to nursing or supplemental nursing Indiana bat pups are expected.
- Indiana bats repeatedly foraging or roosting within 7000 m of active mobile fog oil smoke training locations, will be exposed to unsafe concentrations of fog oil, and exhibit chronic inhalation effects.
- Indiana bats hibernating in Davis No. 2, Wolf Den, and Joy caves will inhale concentrations of fog oil released from Bailey/McCann mobile fog oil training area that will result in chronic inhalation effects.
- Indiana bats hibernating in Davis No. 2 and Joy caves will inhale unsafe concentrations of fog oil from Cannon Range (Mush Paddle Hollow) mobile smoke training area that will result in chronic inhalation effects.

9.2.1.2 Ingestion

Static Training

No acute or chronic ingestion effects were determined for foraging or roosting Indiana bat adults or pups from static fog oil training. Although incidental ingestion of fog oil may occur if Indiana bats occasionally groom during non torpid periods during the winter, we assumed the dose of fog oil through this pathway, if it occurs, was extremely low and non toxic.

Mobile Training

No acute or chronic ingestion effects are expected for foraging, roosting or hibernating

Indiana bat adults or pups from mobile fog oil training.

9.2.1.3 Dermal Absorption

Static Training

No acute or chronic dermal absorption effects were determined for foraging, roosting,

or hibernating Indiana bat adults or pups from static fog oil training.

Mobile Training

No acute or chronic dermal absorption effects were determined for foraging, roosting,

or hibernating Indiana bat adults or pups from mobile fog oil training.

9.2.2 Gray Bats

We assessed effects to foraging (installation-wide) and roosting (in maternity caves)

bats from fog oil smoke training. Figure 36 presents locations of gray bat caves and fog oil

training areas. We assumed nursing pups and supplemental nursing pups occur at the same

locations as roosting and foraging adults, respectively. Distances from each training location

to gray bat maternity caves are provided in Table 23.

9.2.2.1 Inhalation

Static Training

Gray bats will inhale unsafe concentration of fog oil smoke from static training on Fort

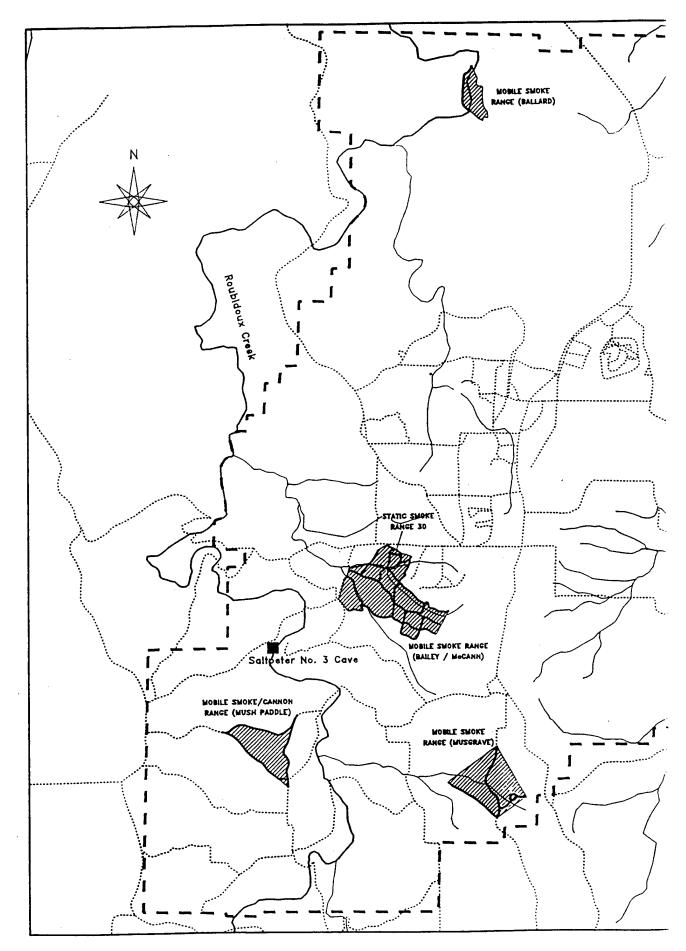
Leonard Wood. Foraging gray bats, and gray bats in the maternity colony in Saltpeter No. 3

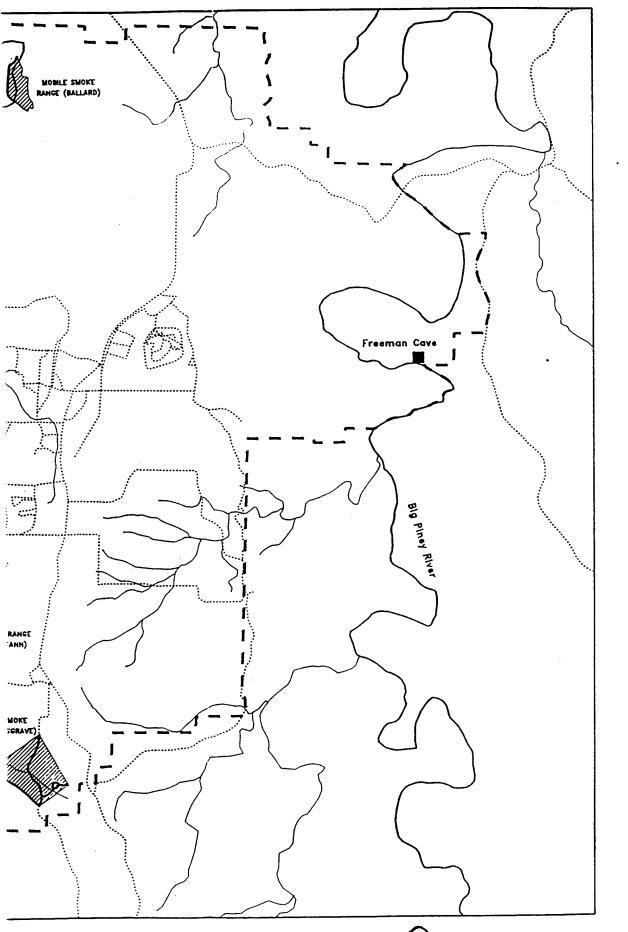
Cave will be affected.

No acute inhalation effects from static fog oil training are expected to foraging or

roosting gray bats.

APPENDIX





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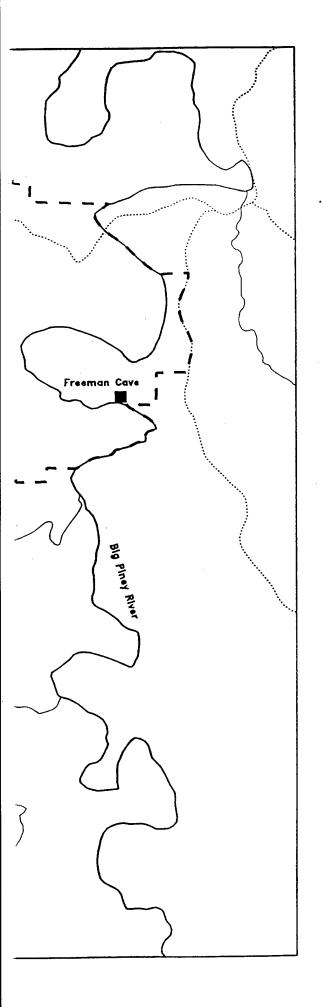
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FIGURE 36. G: proposed fog oil si at Fort Leonard Wc

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FIGURE 36. Gray bat caves and proposed fog oil smoke training locations at Fort Leonard Wood, Missouri.

- Gray Bat Cave
- Offroad Mobile Smoke Training Range
- --- Mobile Smoke Deployment Road
- Fort Leonard Wood Boundary
- ······ Road
- --- River / Stream



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TABLE 23. Distance from gray bat caves to static and mobile fog oil smoke training locations on Fort Leonard Wood, Missouri.

Cave	Fog Oil Smoke Training Location	Distance (m)
Freeman	Static Smoke TA at 30F	12,547
Freeman	Mobile Smoke TA at Musgrave Hollow	13,104
Freeman	Mobile Smoke TA at Cannon Range (Mush Paddle Hollow)	16,542
Freeman	Mobile Smoke TA at Bailey/McCann Hollow	12,024
Freeman	Mobile Smoke TA at Ballard Hollow	11,266
Great Spirit	Static Smoke TA at 30F	9524
Great Spirit	Mobile Smoke TA at Musgrave Hollow	14,973
Great Spirit	Mobile Smoke TA at Cannon Range (Mush Paddle Hollow)	12,357
Great Spirit	Mobile Smoke TA at Bailey/McCann Hollow	9307
Great Spirit	Mobile Smoke TA at Ballard Hollow	7430
Saltpeter No. 3	Static Smoke TA at 30F	3682
Saltpeter No. 3	Mobile Smoke TA at Musgrave Hollow	5462
Saltpeter No. 3	Mobile Smoke TA at Cannon Range (Mush Paddle Hollow)	1751
Saltpeter No. 3	Mobile Smoke TA at Bailey/McCann Hollow	2108
Saltpeter No. 3	Mobile Smoke TA at Ballard Hollow	13,893

- No acute or chronic inhalation effects to nursing or supplemental nursing gray bat pups are expected.
- Gray bats repeatedly foraging within 4000 m of static fog oil generators will inhale concentrations of fog oil resulting in chronic inhalation effects.
- Gray bats repeatedly roosting in Saltpeter No. 3 Cave will inhale unsafe concentrations of fog oil from static smoke training which will result in chronic inhalation effects.

Mobile Training

Gray bats will inhale unsafe concentration of fog oil smoke from mobile training on Fort Leonard Wood. Foraging gray bats, and gray bats in the maternity colony in Saltpeter No. 3 Cave will be affected.

- No acute inhalation effects from mobile fog oil training are expected to foraging or roosting gray bats.
- No acute or chronic inhalation effects to nursing or supplemental nursing gray bat pups are expected.

• Gray bats repeatedly foraging within 7000 m of mobile fog oil generators will inhale concentrations of fog oil resulting in chronic inhalation effects.

 Gray bats repeatedly roosting in Saltpeter No. 3 Cave will inhale unsafe concentrations of fog oil from mobile smoke training on Bailey/McCann, Cannon Range (Mush Paddle Hollow), and Musgrave hollows.

9.2.2.2 Ingestion

Static Training

No acute or chronic ingestion effects were determined for foraging or roosting gray bat adults or nursing pups from static fog oil training.

Mobile Training

No acute or chronic ingestion effects were determined for foraging or roosting gray bat adults, nursing pups, or supplemental nursing young from mobile fog oil training.

9.2.2.3 Dermal Absorption

Static Training

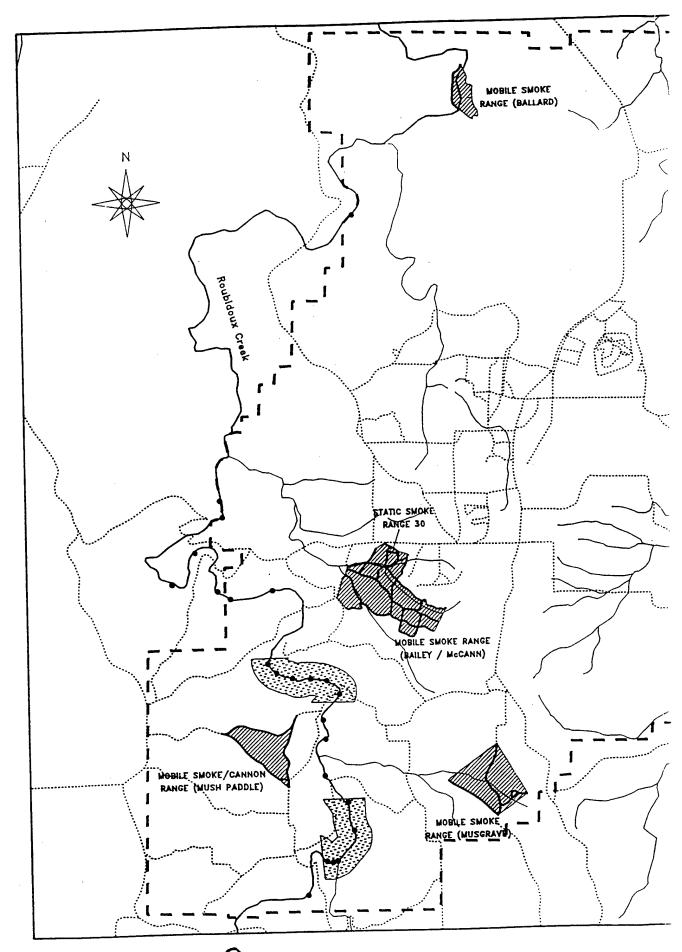
No acute or chronic dermal absorption effects were determined for foraging or roosting gray bat adults, nursing pups, or supplemental nursing young from static fog oil training.

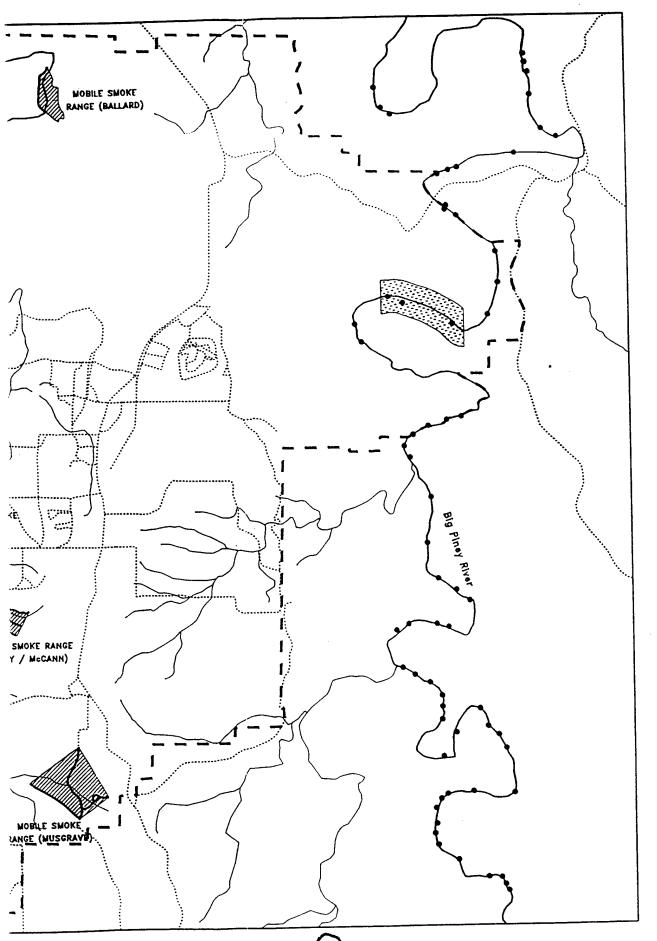
Mobile Training

No acute or chronic dermal absorption effects were determined for foraging or roosting gray bat adults, nursing pups, or supplemental nursing young from mobile fog oil training.

9.2.3 Bald Eagles

Bald eagles will not be affected by fog oil smoke training. We evaluated effects to bald eagles foraging (installation-wide) or perching (along the Roubidoux Creek, Big Piney River, or other nearby waterways) on the installation during the winter, and summering eagles in 3 nests near Fort Leonard Wood. We also assessed effects to bald eagle eggs, hatchlings, and juveniles, and determined there were no effects from fog oil training. Figure 37 presents bald eagle sightings, concentration areas, and proposed fog oil smoke training locations on Fort





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FIGURE 37. concentration c oil smoke train Leonard Wood,

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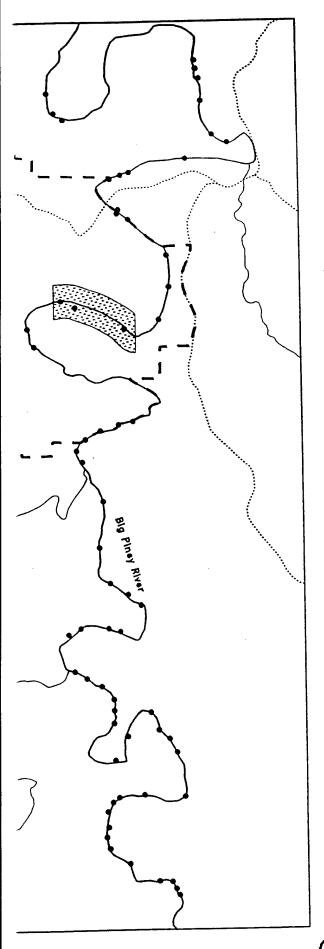
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APPENDIX IV TO BIOLOGICAL ASSESSMENT:

RELOCATION OF U.S. ARMY CHEMICAL SCHOOL AND MILITARY POLICE SCHOOL TO FORT LEONARD WOOD, MISSOURI

FIGURE 37. Bald eagle sightings, concentration areas, and proposed fog oil smoke training locations at Fort Leonard Wood, Missouri.

- Bald Eagle Sighting
- Bald Eagle Concentration Area
- Offroad Mobile Smoke Training Range
- --- Mobile Smoke Deployment Road
- Fort Leonard Wood Boundary
- ----- Road
- River / Stream



3D/ENVIRONMENTAL

Leonard Wood. Figure 38 presents locations of 3 bald eagle nests in relation to the fog oil smoke training areas. Table 24 provides distances from the nearest river bank in areas where bald eagle use is documented to smoke training locations. Table 25 provides the distances from each bald eagle nest to fog oil smoke training locations.

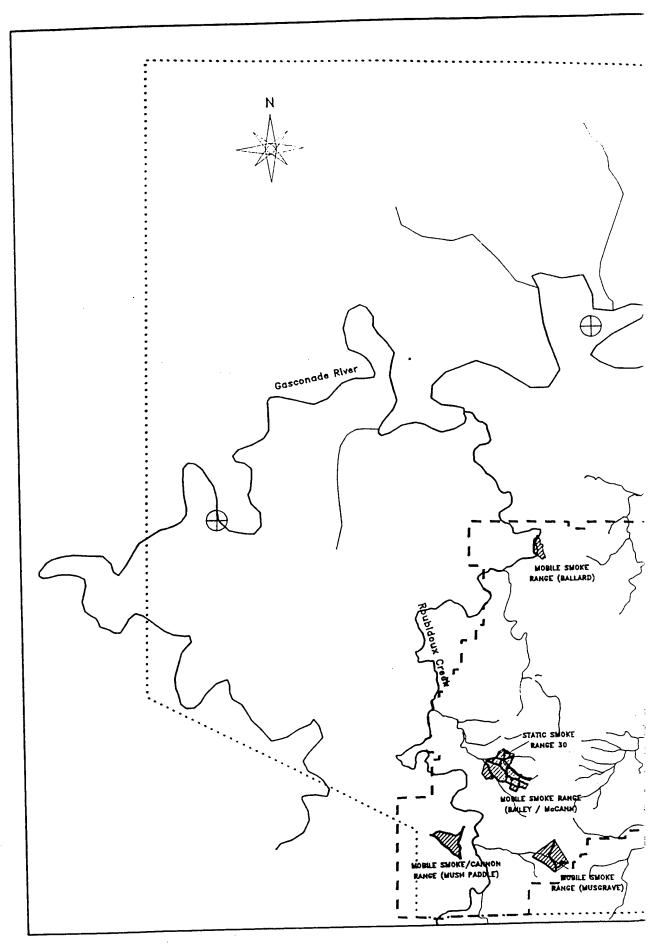
No acute or chronic inhalation, ingestion, or dermal absorption effects were determined for foraging, perching, or nesting bald eagles based on conditions assessed in this study. We do not anticipate any effects from fog oil smoke training to bald eagle adults or other sensitive life cycle stages (eggs, hatchlings, or juveniles).

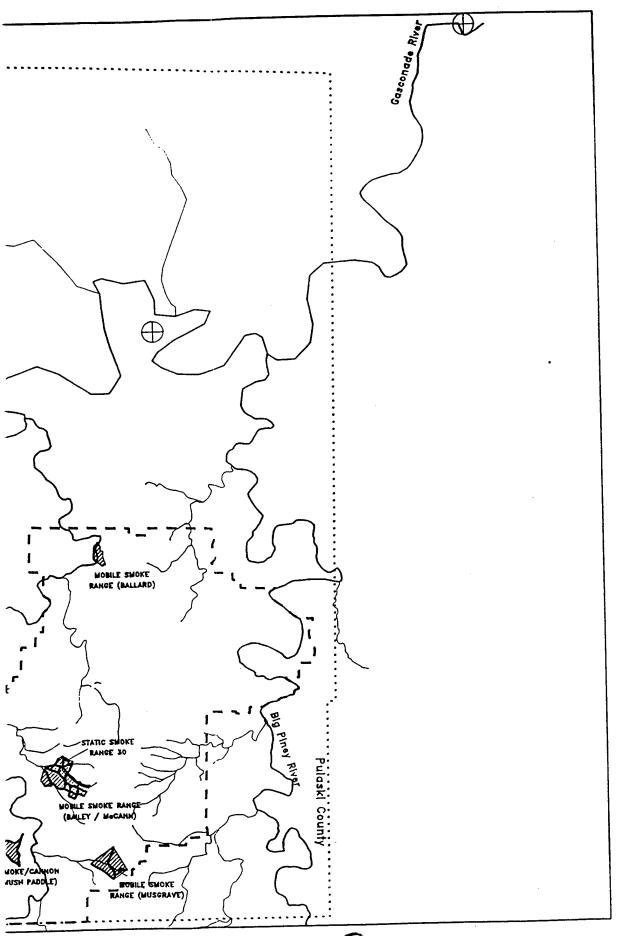
TABLE 24. Distance from fog oil training locations to waterways where bald eagle use is documented.

Fog Oil Smoke Training Location	Roubidoux Ck.	Big Piney R.
Static Smoke TA at 30F Mobile Smoke TA at Cannon Range (Mush Paddle Hollow) Mobile Smoke TA at Bailey/McCann Hollow Mobile Smoke TA at Musgrave Hollow Mobile Smoke TA at Ballard Hollow	2500 m 550 m 800 m 2500 m 3275 m	11,000 m 14,700 m 10,250 m 11,080 m 8975 m

TABLE 25. Distance from fog oil training locations to bald eagle nests.

Nest	Fog Oil Smoke Training Location	Distance (m)
South	Static Smoke TA at 30F	20,229
South	Mobile Smoke TA at Musgrave Hollow	25,174
	Mobile Smoke TA at Cannon Range (Mush Paddle Hollow)	20,749
South	Mobile Smoke TA at Bailey/McCann Hollow	19,717
South South	Mobile Smoke TA at Ballard Hollow	17,463
B. At al	Static Smoke TA at 30F	23,638
Mid	Mobile Smoke TA at Musgrave Hollow	27,956
Mid	Mobile Smoke TA at Musgrave Hollow Mobile Smoke TA at Cannon Range (Mush Paddle Hollow)	28,050
Mid	Mobile Smoke TA at Bailey/McCann Hollow	23,623
Mid Mid	Mobile Smoke TA at Ballard Hollow	11,677
North	Static Smoke TA at 30F	45,057
	Mobile Smoke TA at Musgrave Hollow	48,211
North	Mobile Smoke TA at Masgrave Hollow Mobile Smoke TA at Cannon Range (Mush Paddle Hollow)	49,712
North	Mobile Smoke TA at Bailey/McCann Hollow	44,956
North North	Mobile Smoke TA at Ballard Hollow	34,057





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FIGURE 38.

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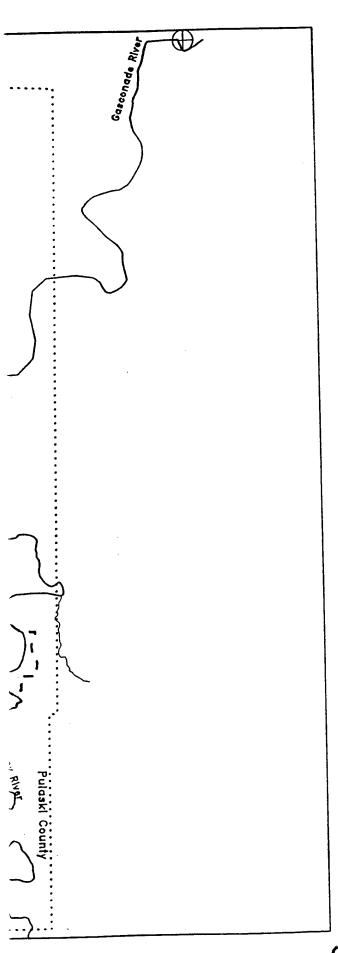
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RELOCATION OF U.S. ARMY CHEMICAL SCHOOL AND MILITARY POLICE SCHOOL TO FORT LEONARD WOOD, MISSOURI

FIGURE 38. Bald eagle nests and proposed fog oil smoke training locations at Fort Leonard Wood, Missouri.

- Bald Eagle Nest
- Offroad Mobile Smoke Training Range
- —— Mobile Smoke Deployment Road
- Fort Leonard Wood Boundary
- County Boundary
- --- River / Stream

Kilometers 5

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9.3 RISK OF EXPOSURE TO TEREPHTHALIC ACID GRENADES AND SMOKE POTS

We determined the ingestion and dermal absorption pathways were incomplete for all three receptors from TPA grenades and TPA smoke pots. The following discussion details effects from inhaling TPA smoke. We considered exposures last 2.5 minutes for grenades and smoke pots. This is based on expected burn time of each. While TPA smoke may remain in the air after the source is depleted, the exposure concentrations used in our calculations were peak (greatest) concentrations, and result in doses higher than what would be received by receptors exposed to a mean contaminant concentration for 10 minutes (the estimated time TPA smoke clouds exist).

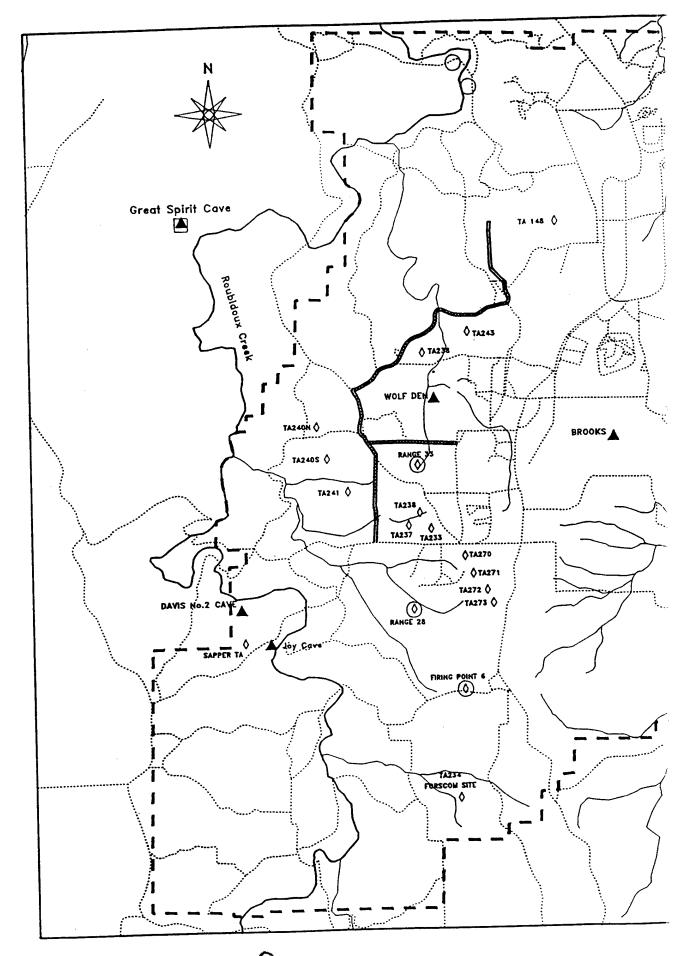
9.3.1 TPA Grenades

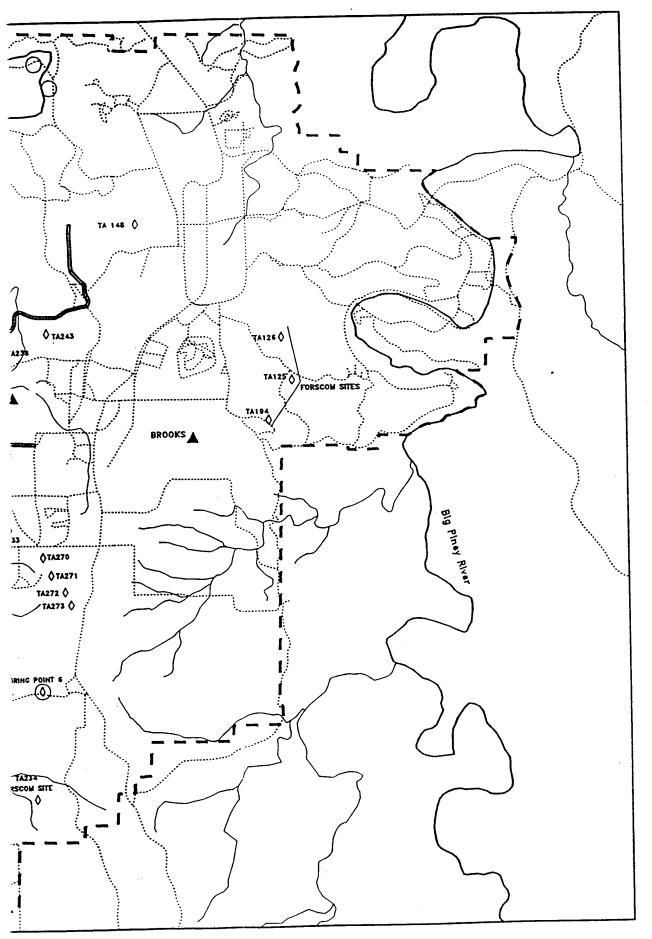
9.3.1.1 Indiana Bat - Inhalation

Indiana bats will be affected by TPA grenades on Fort Leonard Wood. Grenades will be deployed at 22 locations on Fort Leonard Wood (Figure 39). Indiana bat hibernacula are between 650 m and 13,270 m from grenade training ranges (Figure 39). Table 26 presents the distance from Indiana bat hibernacula to central points within each grenade use area. Great Spirit Cave was omitted from this table because it is over 3000 m from the Installation boundary. We assessed effects of TPA grenades to foraging and roosting (installation-wide) and hibernating (in hibernacula) Indiana bats. We assessed effects to adults, nursing pups, and supplemental nursing young. We assumed nursing young and supplemental nursing young occur at the same locations as summer roosting and foraging adults, respectively.

Indiana bats will inhale unsafe concentrations of TPA from grenades.

- Adult Indiana bats, nursing pups, and supplemental nursing pups foraging or roosting within 3000 m of any TPA grenade training location will inhale unsafe concentrations of TPA smoke and exhibit acute toxicological effects.
- Indiana bats repeatedly foraging or roosting within 3000 m of TPA grenade training location will inhale unsafe concentrations of TPA and exhibit chronic toxicological effects.





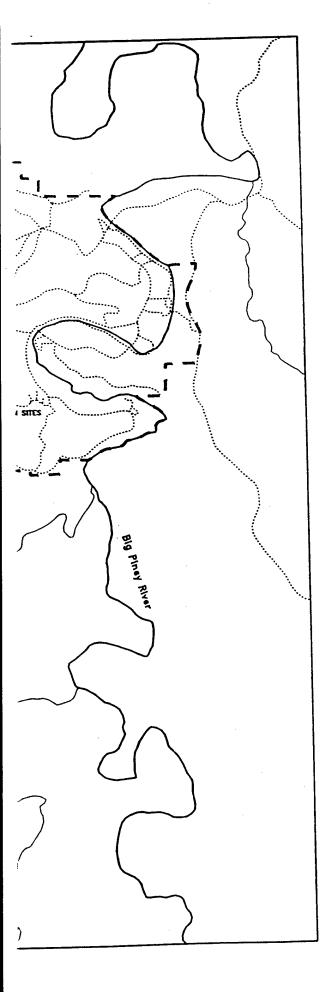
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FIGURE 39.
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RELOCATION OF U.S. ARMY CHEMICAL SCHOOL AND MILITARY POLICE SCHOOL TO FORT LEONARD WOOD, MISSOURI

FIGURE 39. Indiana bat hibernacula and proposed smoke pot and smoke grenade training locations at Fort Leonard Wood, Missouri.

- ▲ Indiana Bat Hibernaculum
- Indiana Bat Hibernaculum/ Gray Bat Cave
- O Smoke Pot Use Area
- ♦ Smoke Grenade Use Area
- Smoke Grenade Training Road
- Fort Leonard Wood Boundary
- Road
- River / Stream

Kilometers

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TABLE 26. Distance (m) from central points within grenade use locations to Indiana bat hibernacula on Fort Leonard Wood.

				love
Grenade	Wolf Den	Davis No. 2	Brooks	Joy
Use Location	Cave	Cave	Cave	Cave
TA 148	5220	12,290	5430	12,530
243	1820	8870	4450	9130
	1170	7780	5180	8130
238	3030	4900	7390	5500
240N	3070	4300	7150	4790
240S	3150	3950	6740	4240
241	1690	5660	4920	5740
Range 33		5050	5160	4940
238B	2820	5130	5050	4910
233	3180	4650	5540	4520
237	3180	5730	4680	5310
270	3930		4820	5340
271	4400	5840 6440	4880	5550
272	4880	6140	5040	5630
273	5230	6270	6520	3650
Range 28	5200	4270	-	4940
FP6	7190	5890	7200	650
Sapper TA	7660	810	10,470	13,120
TA 126	6790	13,270	3310	•
125	6900	13,000	2830	12,760
194	6330	12,080	1930	11,790
234	9810	7110	9610	6000
Road	1080	3730	3880	3640

 Indiana bats hibernating in Davis No. 2, Joy, Brooks, and Wolf Den will inhale unsafe concentrations of TPA and exhibit acute toxicological effects. Table 27 presents specific TPA grenade training areas from which unsafe TPA concentrations will reach Indiana bat hibernacula.

9.3.1.2 Gray Bat - Inhalation

Gray bats will inhale unsafe concentrations of TPA from grenades while foraging (installation-wide) or roosting in maternity colonies on Fort Leonard Wood, Missouri. Figure 40 presents the location of TPA grenade use areas in relation to Freeman and Saltpeter No. 3 gray bat caves. Great Spirit Cave was omitted from this table because it is over 3000 m from the Installation boundary. We assessed effects to adults, nursing pups, and supplemental

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TABLE 27. TPA grenade training locations within 3000 m of Indiana bat hibernacula. Chronic and acute inhalation effects to Indiana bats in hibernacula are based on the concentration of TPA in the cave.

Grenade Use	Indiana Bat Hibernacula			
Location	Wolf Den	Davis No. 2	Brooks	Joy
TA 243	yes			
TA 238	yes			
Range 33	yes			
TA 238B	yes			
Sapper TA	•	yes		yes
TA 125		•	yes	,
TA 194			yes	
Road	yes		,	

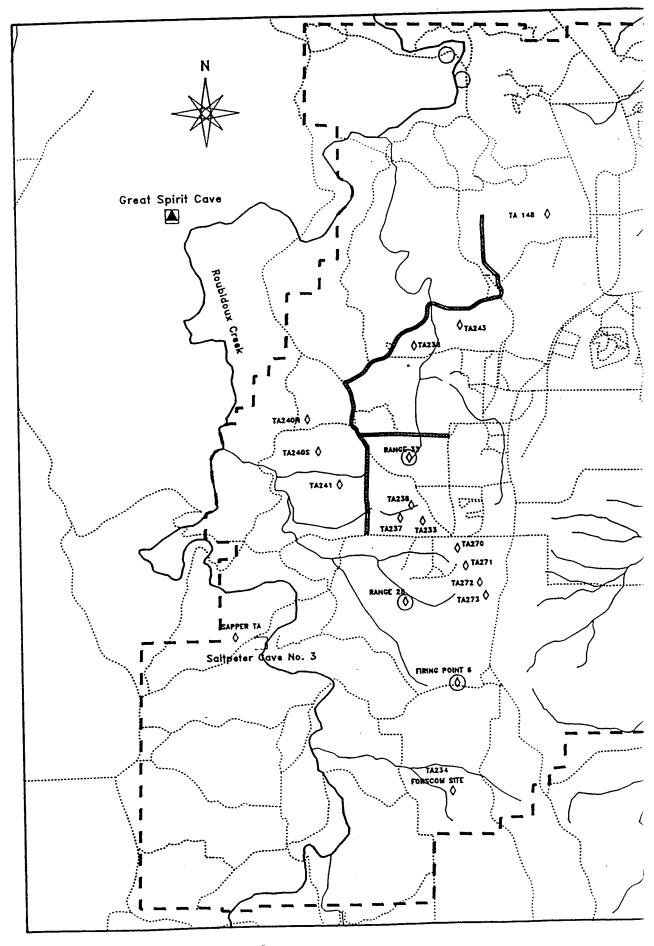
nursing pups. We assumed nursing young and supplemental nursing young occur at the same locations as summer roosting and foraging adults, respectively. Table 28 presents the distance from gray bat caves to central points within each grenade use area.

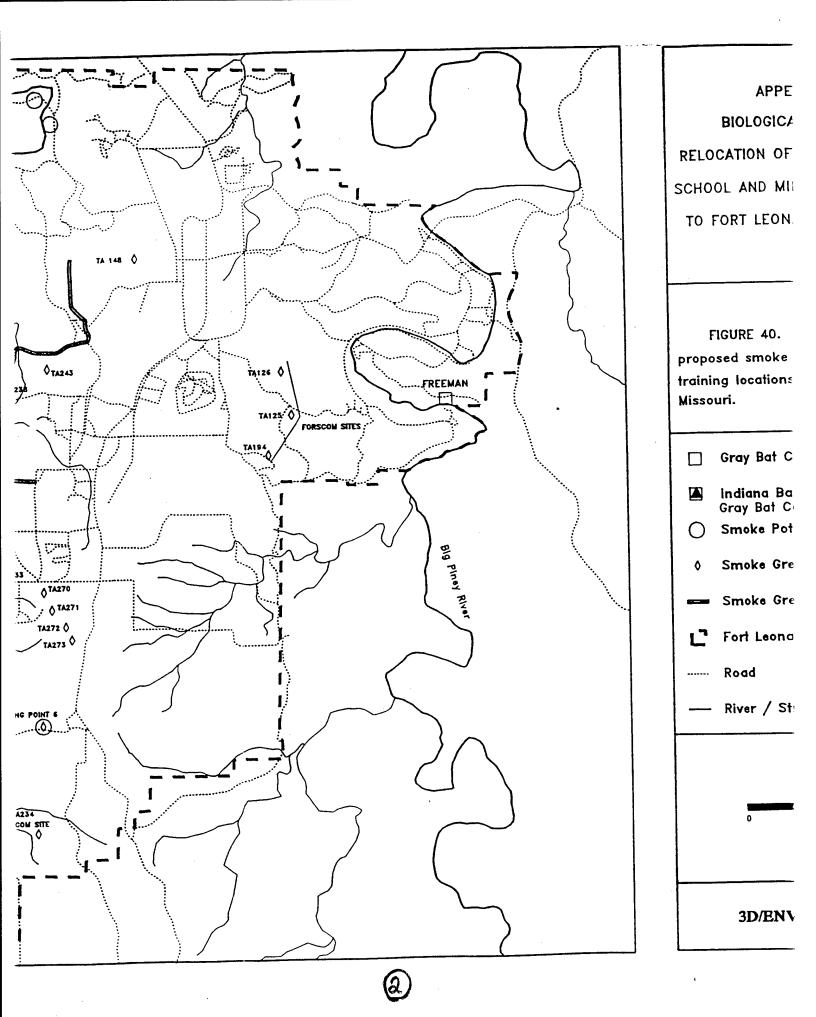
Gray bats will be affected by inhaling unsafe concentrations of TPA from grenades while foraging or roosting in maternity caves on Fort Leonard Wood.

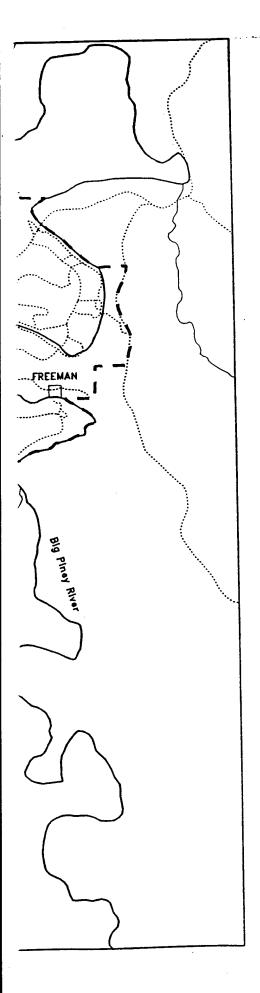
- Adult gray bats and supplemental nursing young foraging within 3000 m of any of the 22 TPA grenade training locations will inhale unsafe concentrations of TPA smoke and exhibit acute toxicological effects.
- Gray bats repeatedly foraging within 3000 m of any of the 22 TPA grenade training locations will inhale unsafe concentrations of TPA and exhibit chronic toxicological effects.
- Adult gray bats, nursing young, and supplemental nursing young in Saltpeter No. 3
 Cave will inhale unsafe concentrations of TPA from grenades released at 1 of 22
 grenade training locations and exhibit acute toxicological effects. Table 29 presents
 specific TPA grenade training areas from which unsafe TPA concentrations will
 reach gray bat caves.

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APPENDIX IV TO BIOLOGICAL ASSESSMENT:

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FIGURE 40. Gray bat caves and proposed smoke pot and smoke grenade training locations at Fort Leonard Wood, Missouri.

- Gray Bat Cave
- Indiana Bat Hibernaculum/ Gray Bat Cave
- O Smoke Pot Use Area
- ◊ Smoke Grenade Use Area
- Smoke Grenade Training Road
- Fort Leonard Wood Boundary
- Road
- River / Stream

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TABLE 28. Distances from central points within grenade use locations to gray bat caves on Fort Leonard Wood.

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Grenade Use	Gray Bat Caves		
Location	Saltpeter No. 3 (m)	Freeman (m)	
TA 148	12,600	8360	
243	9200	9850	
238	8200	10,950	
240N	5580	13,690	
240S	4870	13,540	
_ :	4310	13,210	
241	5810	11,360	
Range 33	5000	11,620	
238B	4970	11,490	
233	4570	12,000	
237	5350	10,970	
270	5370	10,990	
271	5580	10,890	
272	5650	10,930	
273 Bango 28	3680	12,720	
Range 28	4930	12,750	
FP6	660	16,850	
Sapper TA	13,170	4080	
TA 126	12,810	3790	
125	11,830	4550	
194	5960	14,640	
234	3730	9210	
Road	3700		

TABLE 29. TPA grenade training locations within 3000 m of gray bat caves. Chronic and acute inhalation effects to gray bats in caves are based on the concentration of TPA that reaches the cave.

Grenade Use Location	Saltpeter No. 3 Cave
Sapper TA	yes

 Gray bats repeatedly roosting in Saltpeter No. 3 Cave will inhale unsafe concentrations of TPA from grenades released at 1 of the 22 grenade training locations and exhibit chronic toxicological effects (Table 29).

9.3.1.3 Bald Eagle - Inhalation

Bald eagles will be affected by TPA grenades on Fort Leonard Wood. Wintering adult and juvenile bald eagles will inhale unsafe concentrations of TPA from grenades while traveling (installation-wide) or perching/foraging (along the Roubidoux Creek or Big Piney River). Figure 41 presents locations of TPA grenade use in relation to bald eagle sightings and concentration areas on the Big Piney River and Roubidoux Creek. Table 30 presents distances measured from the Roubidoux Creek and Big Piney River to central points within the 22 grenade training areas. We assessed effects to adult, juvenile, and hatchling bald eagles, as well as bald eagle eggs. We assumed juveniles occur at the same locations as adults. We calculated exposures assuming hatchlings and eggs occur at each of three known nest sites.

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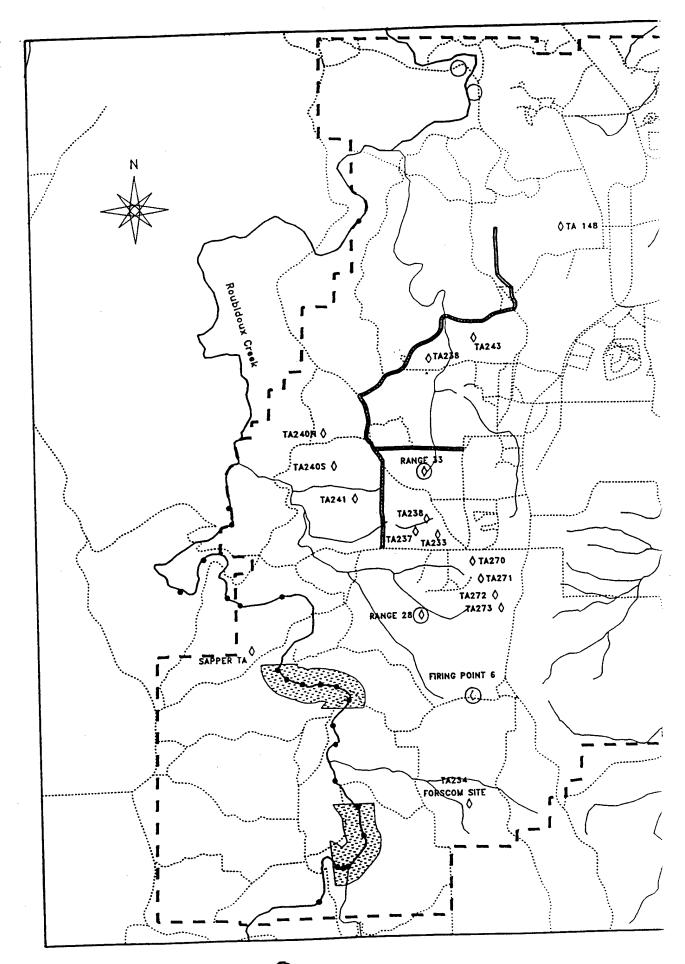
TPA released from grenades will not affect summering bald eagles in nests because unsafe concentrations of TPA will not reach eagle nests. All three bald eagle nest are greater than 3000 m from the installation boundary. Bald eagle eggs and hatchlings will not be affected.

Bald eagles will inhale unsafe concentrations of TPA released from grenades on Fort Leonard Wood.

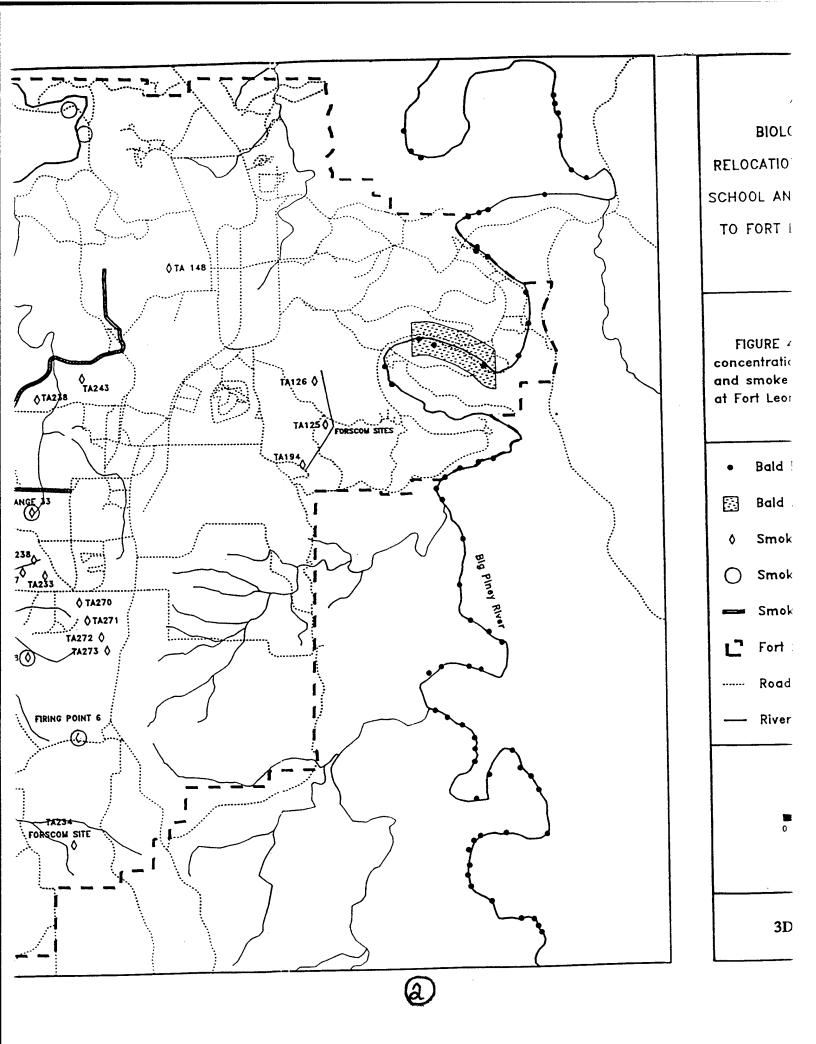
- Wintering juvenile and adult bald eagles traveling, foraging, or perching within 3000 m of any TPA grenade training location will inhale unsafe concentrations of TPA smoke and exhibit acute toxicological effects (Table 31).
- No chronic effects are anticipated for bald eagles from TPA grenade training.

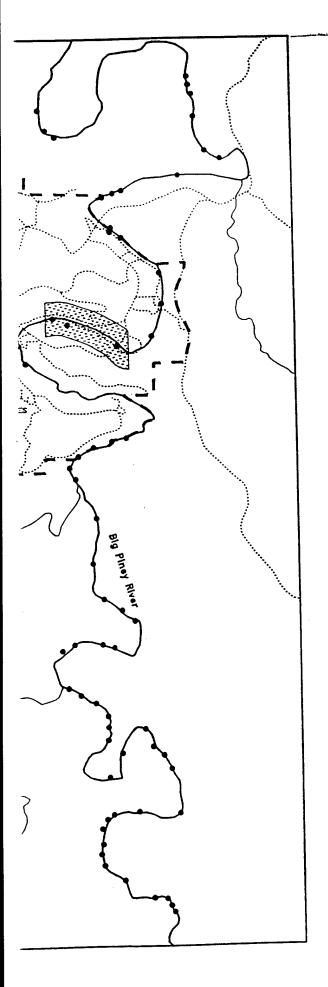
9.3.2 TPA Smoke Pots

TPA smoke pots will be used at the 4 mobile smoke ranges (Figure 7) and at 5 other locations (Figure 39).



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FIGURE 41. Bald eagle sightings, concentration areas, and smoke pot and smoke grenade training locations at Fort Leonard Wood, Missouri.

- Bald Eagle Sighting
- Bald Eagle Concentration Area
- ♦ Smoke Grenade Use Area
- O Smoke Pot Use Area
- Smoke Grenade Training Road
- Fort Leonard Wood Boundary
- ----- Road
- River / Stream

Kilometers

3D/ENVIRONMENTAL

TABLE 30. Distances from central points within grenade use locations to the Roubidoux Creek and Big Piney River.

Grenade Use	Bald Eagle Perching /Foraging Habitat	
Location	Roubidoux Creek	Big Piney River
TA 148	4860	5760
243	3970	7490
238	3470	8680
240N	1820	11,590
240N 240S	2320	11,550
2403	2720	11,290
Range 33	4280	9430
238B	3560	9850
233	3590	9690
	3160	10,240
237 270	4130	8660
	4240	8390
271 272	4370	7980
273	4320	7780
	2640	9760
Range 28 FP 6	3090	8520
	750	13,880
Sapper TA TA 126	8030	1770
	8960	1900
125	9690	2940
194	2750	9740
234 Bood	2650	6840
Road		

TABLE 31. TPA grenade training locations within 3000 m of bald eagle perching/foraging habitat. Chronic and acute inhalation effects from TPA grenades extend 3000 m from the source.

Grenade Use Location	Roubidoux Creek	Big Piney River
240N	yes	
240S	yes	
241	yes	
Range 28	yes	
Sapper TA	yes	
TA 126		yes
TA 125		yes
TA 194		yes
TA 234	yes	
Road	yes	

9.3.2.1 Indiana Bat Inhalation

Indiana bats will inhale unsafe concentrations of TPA released from smoke pots. We evaluated effects to hibernating and foraging/roosting Indiana bats that will inhale unsafe concentrations of TPA from smoke pots. Several TPA smoke pot training locations are near Indiana bat hibernacula (Figure 39). Table 32 indicates distances from TPA smoke pot use areas to hibernacula. Great Spirit Cave was omitted from this table because it is over 3000 m from the Installation boundary. Table 22 presents distances from mobile fog oil smoke training areas where TPA smoke pots are used, to Indiana bat hibernacula. We assessed effects to adults, nursing pups, and supplemental nursing pups. We assumed nursing young and supplemental nursing young occur at the same locations as summer roosting and foraging adults, respectively.

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- Adult Indiana bats, nursing pups, and supplemental nursing pups foraging or roosting within 3000 m of any of the 9 TPA smoke pot training locations will inhale unsafe concentrations of TPA smoke and exhibit acute toxicological effects.
- Indiana bats repeatedly foraging or roosting within 3000 m of any of the 9 TPA smoke pot training locations will inhale unsafe concentrations of TPA and exhibit chronic toxicological effects.

TABLE 32. Distance from smoke pot use locations to Indiana bat hibernacula on Fort Leonard Wood. Distances to smoke pot use areas outside mobile smoke areas are to a central point within the smoke pot use area.

_	Indiana Bat Hibernacula			
Smoke Pot Use Location	Brooks	Davis No. 2	Wolf Den	Joy
Cannon Range (Mush Paddle Hollow)	10,335	2889	8432	1803
Bailey McCann Hollow	5803	2423	3861	2045
Musgrave Hollow	8031	6624	8609	5499
Ballard Hollow	8449	13,352	6859	13,821
FP6	7204	5885	7191	4942
Range 28	6516	4274	5202	3650
Range 33	4918	5658	1685	5743
Ballard - In	9231	13,987	7608	14,525
Ballard - Out	9913	14,371	8150	14,926

 Indiana bats hibernating in Davis No. 2, Joy, and Wolf Den caves will inhale unsafe concentrations of TPA and exhibit acute toxicological effects. Table 33 presents the specific TPA smoke pot training areas from which unsafe TPA concentrations will reach Indiana bat hibernacula.

9.3.2.2 Gray Bat - Inhalation

Gray bats will inhale unsafe concentrations of TPA from smoke pots on Fort Leonard Wood while foraging (installation-wide) or roosting in caves. Several TPA smoke pot use areas are near gray bat caves (Figure 40). Table 34 presents distances from smoke pot use areas to gray bat caves on Fort Leonard Wood. Great Spirit Cave was omitted from this table because it is over 3000 m from the Installation boundary. We assessed effects to adults, nursing pups, and supplemental nursing pups. We assumed nursing young and supplemental nursing young occur at the same locations as summer roosting and foraging adults, respectively.

Gray bats will be affected by inhaling unsafe concentrations of TPA from smoke pots while foraging or roosting in caves on Fort Leonard Wood.

 Adult and supplemental nursing gray bat young foraging within 3000 m of any of the 9 TPA smoke pot training locations will inhale unsafe concentrations of TPA smoke and exhibit acute toxicological effects.

TABLE 33. TPA smoke pot training locations, as listed in Table 32, within 3000 m of Indiana bat hibernacula. Chronic and acute inhalation effects to Indiana bats in hibernacula are based on the concentration of TPA in the cave.

Smoke Pot Use	Indiana	Bat Hibernacu	ıla
Location	Davis No. 2	Wolf Den	Joy
Range 33		yes	
Cannon Range (Mush Paddle Hollow)	yes		yes
Bailey/McCann Hollow	yes		yes

TABLE 34. Distances from pot use locations to gray bat caves on Fort Leonard Wood. Distances to smoke pot use area outside mobile smoke areas are to a central point in the deployment area.

Smoke Pot Use	Gray Bat Cave (m)		
Location	Saltpeter No. 3	Freeman	
Cannon Range (Mush Paddle Hollow)	1751	16,542	
Bailey McCann Hollow	2108	12,024	
Musgrave Hollow	5462	13,104	
Ballard Hollow	13,893	11,266	
FP6	4932	12,751	
Range 28	3677	12,718	
Range 33	5808	11,361	
Ballard - In	14,578	11,814	
Ballard - Out	15,002	12,460	

- Gray bats repeatedly foraging within 3000 m of any of the 9 TPA smoke pot training locations will inhale unsafe concentrations of TPA and exhibit chronic toxicological effects.
- Gray bats in Saltpeter No. 3 Cave will inhale unsafe concentrations of TPA from smoke pots released at 2 of the 9 smoke pot training locations and exhibit acute toxicological effects (Table 35).
- Gray bats repeatedly roosting in Saltpeter No. 3 Cave will inhale unsafe concentrations of TPA from grenades released at 2 of the 9 smoke pot training locations and exhibit chronic toxicological effects (Table 35).

TABLE 35. TPA smoke pot training locations within 3000 m of gray bat caves. Chronic and acute inhalation effects to gray bats in caves are based on the concentration of TPA in the cave.

Smoke Pot Use Location	Saltpeter No. 3
Cannon Range (Mush Paddle Hollow)	yes
Bailey/McCann Hollow	yes

9.3.2.3 Bald Eagle - Inhalation

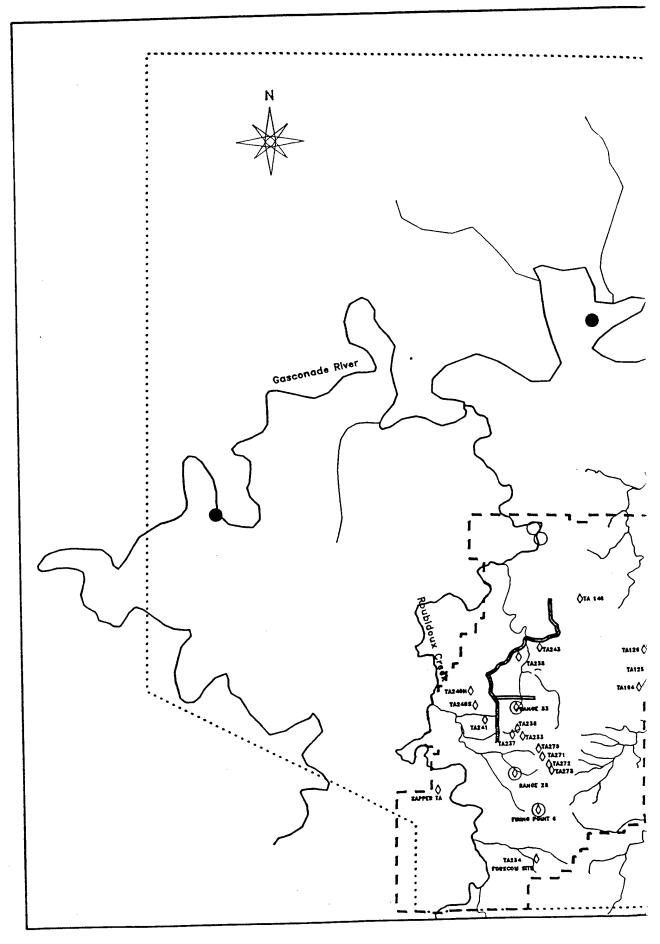
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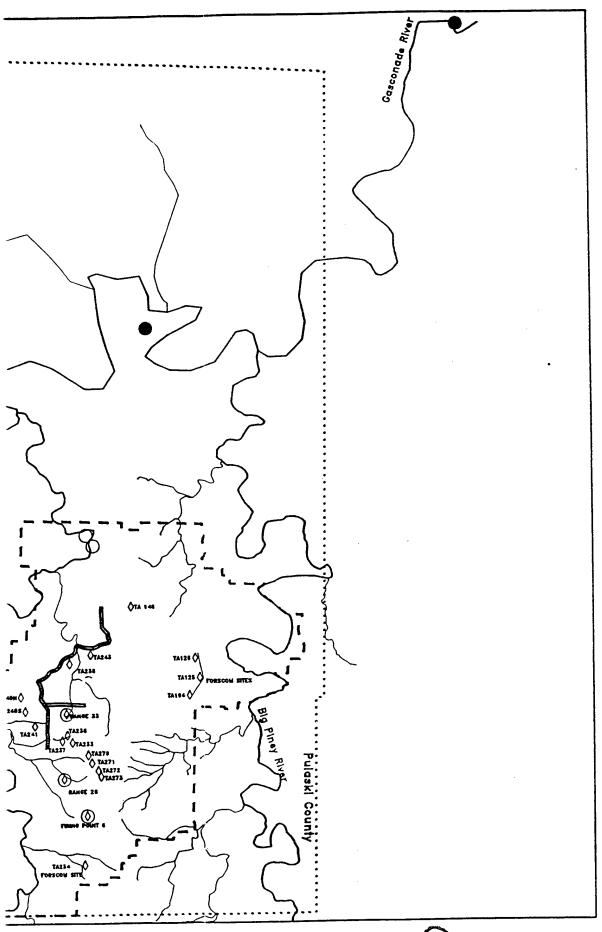
Bald eagles will inhale unsafe concentrations of TPA released from smoke pots on Fort Leonard Wood. We assessed effects to adult and juvenile wintering bald eagles traveling (installation-wide) and perching/foraging (along the Roubidoux Creek and Big Piney River) and summer bald eagles in 3 nests along the Gasconade River. Figure 41 presents the spatial relationship of 5 of the 9 TPA smoke training locations and bald eagle sightings and concentration areas. Figure 37 presents the spatial relationship of bald eagle sightings and concentration areas to TPA smoke pot training locations in mobile fog oil training locations. Table 36 presents distances between bald eagle perching habitat and smoke pot training locations. We assessed effects to juvenile bald eagles and assumed their exposure points would be the same as adults. Effects to bald eagle eggs and hatchlings were assessed for each of the three nest locations.

Summer nesting bald eagles will not be affected by inhaling unsafe concentrations of TPA from smoke pots. All 3 bald eagle nests are greater than 3000 m from the installation boundary. No unsafe concentrations of TPA from smoke pots will reach nests (Figure 42). Bald eagle eggs and hatchlings will not be affected.

TABLE 36. Distances between smoke pot use locations and bald eagle perching / foraging habitat along the Roubidoux Creek and Big Piney River. Distances to smoke pot use areas outside mobile smoke areas are measured to a central point within the use area.

Smoke Pot Use Location	Roubidoux Creek	Big Piney River
Cannon Range (Mush Paddle Hollow)	593	12,685
Bailey/McCann Hollow	823	8868
Musgrave Hollow	2569	7663
Ballard Hollow	3315	7783
FP 6	3085	8523
Range 28	2643	9761
Range 33	4281	9427
Ballard - In	3777	7924
Ballard - Out	3916	8320





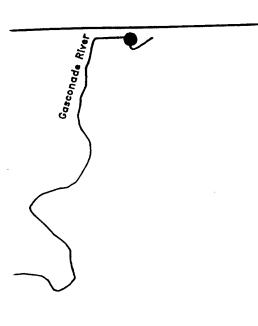
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FIGURE 42. Bal smoke pot and smc locations at Fort Le-

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- Smoke Grenc
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FIGURE 42. Bald eagle nests and smoke pot and smoke grenade training locations at Fort Leonard Wood, Missouri.

- Bald Eagle Nest
- Smoke Grenade Use Area
- O Smoke Pot Use Area
- Smoke Grenade Training Road
 - Fort Leonard Wood Boundary
 - County Boundary
- River / Stream

Kilometers

3D/ENVIRONMENTAL

Bald eagles will inhale unsafe concentrations of TPA released from smoke pots on Fort Leonard Wood.

- Wintering adult and juvenile bald eagles traveling, foraging, or perching within 3000 m of any of the 9 TPA smoke pot training locations will inhale unsafe concentrations of TPA smoke and exhibit acute toxicological effects (Table 37).
- No chronic toxicological effects are expected for bald eagles from TPA smoke pot training.

9.4 RISKS OF EXPOSURE TO M82 - TITANIUM DIOXIDE

Ingestion and dermal absorption pathways were determined to be incomplete for all three receptors. We analyzed inhalation effects of titanium dioxide released from M82 grenades. Based on our analysis, no effects are expected for Indiana bats, gray bats, or bald eagles from titanium dioxide grenades.

TABLE 37. TPA smoke pot training locations within 3000 m of bald eagle perching/foraging habitat. Chronic and acute inhalation effects from TPA smoke pots extend 3000 m from the source.

Smoke Pot Use Location	Roubidoux Creek
Cannon Range (Mush Paddle Hollow)	yes
Bailey/McCann Hollow	yes
Musgrave Hollow	yes
Range 28	yes

Section 10 Studies of Fog Oil Conducted for the BRAC Action

Section X:

Studies of Fog Oil Conducted for the BRAC Action

10.1 BACKGROUND

Smoke training with fog oil is a major training activity performed by the Chemical School at Fort McClellan. The movement of the Chemical School to Fort Leonard Wood will require this training to be continued at Fort Leonard Wood. Because the BRAC action may affect the human environment, an Environmental Impact Statement (EIS) was prepared. The studies summarized in this section were conducted to provide additional information for impact analysis in the EIS, Biological Assessment (BA), and two Ecological Risk Assessments.

Fog oil is a mineral oil resulting from the distillation of petroleum. It is a complex petroleum product that is heated to vaporization to produce smoke for obscurant training. Predicted fog oil use at Fort Leonard Wood and chemical characterization of fog oil can be found in Section V of this ERA. A toxicity profile of fog oil is presented in Section VII.

New fog oil is similar to old fog oil, but undergoes important chemical treatments modify its composition. The precise composition of fog oil is not well characterized. Although the compounds in fog oil have been identified, little data exist describing the isomers of the components and their percent composition. Fog oil has been used by the military for years. Fog oil obscured aircraft carriers and personnel in World War II. The military determined certain components of (old) fog oil may be hazardous to humans and the environment. The military now requires manufacturers to hydrotreat (new) fog oil. Hydrotreating removes the

compounds in fog oil called aromatics. Many aromatics are known or suspected human carcinogens. Old fog oil refers to fog oil manufactured before 1986 that has not been hydrotreated. New fog oil is hydrotreated, and has been manufactured since 1986.

Fog oil has had several designations in its history which may lead to confusion. There are two types of fog oil, "old" fog oil and "new" fog oil. Fog oil also has letter designations used by the military for purchasing or issuing requests for production from manufacturers. Types A and B are "old" fog oil (also referred to as SGF 1) manufactured under specifications A and B before 1986. "New" fog oil, designated as type D, is also referred to as SGF 2 fog oil (Standard Grade Fuel 2). It is the primary material used by the military to produce smoke at Fort McClellan and other installations. Fog oil type D or E will be used at Fort Leonard Wood. Fog oil types C, D, and E are chemically and structurally the same compounds. The designations refer to differing specifications given to manufacturers. The military requires that manufacturers perform carcinogenicity or mutagenicity tests on fog oil type D and E.

The (1) fugacity or environmental fate and transport of fog oil smoke, and (2) the composition of fog oil smoke relative to parent fog oil was poorly understood. Most information that exists was generated in tests only involving old fog oil. Very few studies have addressed fog oil smoke and the effects for the smoke itself. Environmental fate studies have not been conducted on new fog oil. The following studies were performed to provide information regarding these two issues.

10.2 ENVIRONMENTAL FATE OF FOG OIL AT FORT McCLELLAN, ALABAMA. AUGUST, 1996. PREPARED BY 3D/INTERNATIONAL INC., ENVIRONMENTAL GROUP.

10.2.1 Introduction

This study assessed the environmental fate of fog oil in areas where fog oil smoke production had occurred for an extensive amount of time (over 10 years). We statistically evaluated the presence of fog oil and its constituents at 3 exposure sites and a reference site. Fog oil has been used in large quantities (greater than 100,000 gallons per year) for several years at Fort McClellan. We were unable to precisely quantify the quantity used in the 3 exposure sites. Both old and new fog oil have been used in these areas. Only new fog oil was deployed since 1986.

We analyzed fog oil smoke samples from the types of fog oil generators to be used at Fort Leonard Wood. A description of M56 and M157 generators is included in Section V of this ERA. Samples were evaluated to assess chemical transformations, reactions, and decomposition products of fog oil the generators may produce. Several toxicological studies indicate fog oil heated to 500°C on a metal manifold, does not change significantly from the parent fog oil. However, these studies are not conclusive because they do not aerosolize fog oil as do M56 or M157 generators.

10.2.2 Methods

Three exposure sites (Range 24A, Range 56, and Battle Drill Area) and one reference site (Choccolocca Creek) were selected for this study. All samples were collected by employing EPA methods or other standard techniques. Method numbers, standard practices, and laboratory analytical methods are specified in the report.

Soil, surface water, and sediments were sampled from each site. Nineteen soil samples were taken at 3 depths to determine if fog oil components migrate into the soil at detectable concentrations. Samples were taken at 50 m upwind from fog oil release points and at 50 m, 100 m, and 200 m downwind from the release points. Soil sample depths were 3 inches, 1 foot, and 3 feet deep. Surface water and sediment samples were collected at the same location. Ten surface water samples and 10 sediment samples were collected at Range 56, Battle Drill Area, and Choccolocca Creek reference site. Five samples were collected upstream from the fog oil release point at 50 m intervals and 5 samples were collected downstream at 50 m interval locations. The stream at Range 24A was intermittent and samples were taken at 3 locations in 2 different streams near the release area.

Vegetation, insects, fish, and bats were collected from each sample site and analyzed for fog oil components. Three bark and leaf samples were collected from each sample site. Bark and leaf samples at exposure sites were collected as near to the smoke release point as possible. Thirty-five insect samples were collected at each sample site. Insect samples were composited due to the large amount of sample required for analysis. Twelve insect samples from each sample site were analyzed. Thirteen fish from Range 56, Battle Drill Area, and the Choccolocca Creek reference sites were collected and analyzed. No fish could be collected

from the very small stream at Range 24A. Twenty bats were collected from the sample sites. Eight guano samples were taken from gray bats caught during mist -netting.

Additional vegetation and insect sampling was performed at each sample site. Sampling events were paired to reduce variability between sample times when bats and insects were sampled at reference and exposure sites. Insect and bat presence on any night is substantially influenced by weather conditions and other factors unrelated to the presence of contaminants. Insect samples and additional vegetation samples were analyzed to determine if the reference site and the exposure sites were similar in composition and richness.

Fog oil smoke samples were collected from M56 and M157 smoke generators. One background sample was taken before the generators were turned on. Several smoke samples were taken at the generator and at 10 m, 20 m, and 30 m from the generators.

10.2.3 Results and Discussion

Samples collected at Fort McClellan were analyzed for aromatic hydrocarbons, and quantified for quinoline, methyl quinoline, biphenlys, 6 isomers of naphthalene, hexadecane, fluorene, dimethylbiphenyl, methyl fluorene, phenanthrene, anthracene, methylanthracene, methylanthracene, dimethylphenanthrene, ethylanthracene, and hexchloroethane. Samples indicating aromatic compounds were present were further tested to identify the possible compound. Analysis was completed utilizing Gas Chromatography/Mass Spec. Detection (GC/MSD) and Gas Chromatography/Flame Ionization Detection (GC/FID).

Most samples collected at exposure sites were not statistically different from those collected at the reference site. Most of the reference site samples had higher concentrations of hydrocarbons when compared to similar samples from exposure sites.

Bat tissue from two exposure sites had slightly higher concentrations of certain hydrocarbons. Concentrations of six hydrocarbons in bat tissue were significantly (statistically) higher at Range 56 than concentrations at the reference site (p<0.10). Concentrations of six hydrocarbons in bat tissue were significantly (statistically) higher at the Battle Drill Area than concentrations at the reference site (p<0.01). The concentrations of hydrocarbons in bat tissue samples are very small and near the detection limit for each compound. It is likely the 6 hydrocarbons in the samples are biological in origin, rather than from fog oil. No other

concentrations of hydrocarbons were statistically different at exposure and reference sites. None of the hydrocarbons analyzed for this study were found in the fog oil samples or the fog oil smoke samples.

In another phase of this study, we compared fog oil smoke samples to parent fog oil. Based on the analysis for the smoke samples, no aromatic compounds were identified. Approximately 99.2% of the smoke was the same hydrocarbons identified in the fog oil sample. There was a slight shift in lower molecular weight alkanes in the fog oil sample compared to the smoke samples. It appears there is some volatilization of the lower molecular weight hydrocarbons in fog oil when it is aerosolized to form smoke. Presumably, the volatilization results in the formation of carbon dioxide. This is supported by the lack of non-common hydrocarbons in the fog oil and smoke samples.

10.3 EVALUATION OF HUMAN HEALTH RISKS ASSOCIATED WITH FOG OIL TRAINING AT FORT LEONARD WOOD, MISSOURI. PRELIMINARY RISK EVALUATION REPORT. SEPTEMBER 1996. PREPARED BY HARLAND BARTHOLOMEW & ASSOCIATES, INC.

10.3.1 Introduction

This study was conducted to determine potential health risks to soldiers from occupational exposure to fog oil smoke. Field generated smoke samples were analyzed to determine the chemical composition of fog oil smoke. Specific chemicals listed on the EPA's Target Analyte List (volatile and semi-volatile organic compounds) were carried through a screening risk assessment. This Preliminary Risk Evaluation (PRE) was based on EPA Region IX guidance to determine if a hazardous waste site is, or has the potential to, affect the human population in the area. Region IX guidance is also used to rank hazards at sites and determine which chemicals pose the greatest risk. A carcinogenic risk and noncarcinogenic hazard quotient were calculated for each chemical. Chemical concentrations measured in the samples were compared to EPA's Region IX screening level concentrations to see if the fog oil smoke posed potential risks. Intake parameters were based on occupational exposure for the calculations.

A thorough literature review was conducted to determine what information was currently available and what human health effects have been identified for new and old fog oil. The chemical composition of new fog oil is poorly documented.

10.3.2 Methods

Field testing was conducted at U.S. Army Aberdeen Proving Ground, Edgewood, Maryland. Two smoke clouds were tested, one from the M56 generator and the second from a M157 generator. Samples were taken at various distances from the generators (Table 38).

Samples were collected with Summa 6 liter canisters and XAD-2 tubes. Samples were analyzed for VOCs (volatile organic hydrocarbons), SVOCs (semi-volatile organic hydrocarbons), and THC (total hydrocarbons). The report describes laboratory analysis methods.

10.3.3 Results and Discussion

Many compounds were found in the fog oil samples. The specific identification and quantification was not complete, but the overall composition was determined to be less than 2.5% VOCs and SVOCs. Because of the formation of so many isomers and non-TAL compounds, the exact formulation and quantity of many of the compounds were not precisely ascertained in the analysis. The PRE groups compounds based on their structural similarity and toxicity.

TABLE 38. Sample locations and sample types taken at Aberdeen.

Test 1 - M56 Generator	Test 2 - M157 Generator
	2 Reference (Background)
2 Reference (Background)	· · · · · · · · · · · · · · · · · · ·
11 meters	< 1 meter
11 meters	< 1 meter
25 meters	11 meters
25 meters	11 meters
200 meters	100 meters
200 meters	100 meters
Liquid SGF - 2 Fog Oil	Liquid SGF - 2 Fog Oil
Field (Trip) Blank	Laboratory (Method) Blank

The majority of the VOCs and SVOCs in the smoke samples are also commonly found in diesel and gasoline combustion products. It is assumed the small concentrations found in the fog oil samples resulted from the generator fuel source rather than from the fog oil.

The PRE determined the distance from M56 and M157 generators where respiratory protection is needed. Respiratory protection is required where ACGIH (American Conference of Industrial Hygienist) TLV - TWA (Threshold Limit Values) (Time Weighted Average) occupational levels are exceeded.

Section 11 Assumptions and Uncertainty Analysis

Section XI:

Assumptions and Uncertainty Analysis

11.1 ASSUMPTIONS

11.1.1 Chemical Stressors

The following assumptions were made with respect to fog oil, terephthalic acid, titanium dioxide, and other potential chemical stressors at Fort Leonard Wood:

- receptor exposure to stressors was worst-case (i.e., maximum potentially available stressor quantity)
- 2. annual quantity of fog oil consumed by static smoke training is 8500 gallons per year
- 3. static fog oil smoke training would use a maximum quantity of 1200 gallons per day
- 4. annual quantity of fog oil consumed by mobile smoke training is 76,000 gallons per year
- 5. mobile fog oil smoke training would use a maximum quantity of 1200 gallons per day
- 6. daily exposure time equals the daily fog oil consumption rate (gallons/day) divided by the generator output rate of 0.66 gallons/minute-generator times the number of generators

- 7. the number of fog oil training events per year (i.e., exposure frequency) equals the annual consumption of fog oil (gallons/year) divided by the maximum daily use quantity (gallons/day)
- 8. only static or mobile fog oil smoke training occur on a given day
- 9. annual consumption of M82 smoke grenades (which contain titanium dioxide) is 48
- 10. maximum daily use of M82 smoke grenades is 72 with a maximum of 24 per location per day
- 11. M83 smoke grenades (which contain TPA) replace and will have the same annual consumption as G963, G930, AN-M9, and M8
- 12. total annual consumption of M83 grenades is 3136 grenades per year, maximum number to be released from 1 November through 15 March is 2242
- 13. maximum daily use of M83 grenades is 141 with a maximum daily use per location of 24
- 14. annual consumption of M8 smoke pots (which contain TPA) is 950
- 15. maximum daily use of M8 smoke pots is 59 with a maximum daily use per location of 24
- 16. burn time on M83, M8 smoke pot, and M82 is 2.5 minutes
- 17. deployment of each M83, M8 smoke pot, or M82 was considered an exposure event
- 18. the concentration of the simulants remained constant during release periods
- 19. the release rate of BIDS was 1 L per minute
- 20. annual use of PCAS is 1800 L
- 21. each PCAS training event uses 9 L (200 training events/year)

22. the Chemical/Biological Training Simulant and Delivery System (CBTSADS) sprays PCAS at least 10 m high.

23. Anisole, Benzaldehyde, Cyclohexane, Diethyl Malonate (DEM), and Diethyl Phthalate are used in the FOX training simulator (indoors) and will, therefore, not contact receptors

24. Dimethyl phthalate, Ethyl phthalate, Eucalyptol, and Methyl Salicylate are used outdoors, but simulants are contained within a pan of sand which is removed and decontaminated following a 2 hour training event

25. PEG 200 will be used at hasty decontamination sites only and will be sprayed approximately 5 m into the air

26. PEG 200 will not be sprayed onto vegetation or used within bat management zones

27. modeled concentrations of stressors represent realistic potential exposures

28. no site-specific differences in stressor concentrations (e.g., M82 smoke grenades assumed to have same dispersion at all training locations)

29. seasonal cave airflow model is representative of entire year

11.1.2 Receptors

Behavior and ecology of receptors affect their likelihood, duration, and frequency of exposure to stressors. The following assumptions were made with respect to bald eagles, Indiana bats, and gray bats (receptors):

1. bald eagles may be exposed to stressors at nest locations for 7 months

2. bald eagles do not forage on Fort Leonard Wood during summer months

bald eagles are resident at Fort Leonard Wood for 5 months during winter

 bald eagles may travel anywhere on the installation during winter and perch/forage along the Big Piney River and Roubidoux Creek

- 5. when calculating bald eagle exposure to stressors by the ingestion pathway, we assumed bald eagles consumed only waterfowl (scaup) because this would provide the greatest dose of fog oil to the bald eagles
- 6. bald eagles live for 35 years
- 7. foraging or summer roosting Indiana bats can occur anywhere on the installation
- 8. summer Indiana bats may be exposed to stressors at anytime within a 24 hour period
- 9. Indiana bat summer season is 6 months
- 10. hibernating Indiana bats are exposed to stressors only at cave locations and may be exposed anytime in a 24 hour period
- 11. Indiana bat hibernation period is 8 months
- 12. Indiana bats live for 7 years
- 13. gray bats are only present on the installation for 7 months during summer
- 14. gray bats in caves may be exposed to stressors anytime in a 24 hour period
- 15. foraging gray bats will be exposed to M83 grenades, M82 grenades, or M8 smoke pots only at night (we assumed one half of annual consumption of these munitions could be used at night)
- 16. when calculating Indiana bat and gray bat exposure to stressors by the ingestion pathway, we assumed both bat species consumed only beetles with a surface area of 0.000033 m² and a weight of 0.0034 g
- 17, gray bats live for 10 years
- 18. for bald eagles, Indiana bats, and gray bats, we calculated dermal absorption assuming complete coverage of the organism and 100% absorption

19. number of exposure points was appropriate and no exposure points were missed

20. identified exposure pathways were complete and no pathways were missed

21. allometric equations used to calculate intake rates accurately represent intake rates of

receptors

22. the same individual receptors were exposed year after year (i.e., chronic effects are to an

individual exposed for its lifetime)

11.1.3 Toxicity Values

Toxicity values are determined from available studies and are rarely available for

receptor species of interest. In the absence of species specific information, available data is

generally applied to receptors with the use of uncertainty adjustments. The following

assumptions were made with respect to toxicity values:

1. Toxicity Reference Values (TRVs) are unbiased and representative for bald eagles, Indiana

bats, and gray bats

2. baid eagles, Indiana bats, and gray bats will have the same effects for TRVs as reported in

critical studies

3. stressors of concern have same pharmacokinetic effects in receptor species as in test

species from which toxicity value was derived

4. TRVs represent conservative threshold values and are protective of threatened and

endangered species

5. an exposure concentration greater than a TRV is unsafe, while an exposure concentration

less than a TRV is safe

6. the calculated NOAEL (from BATS.XLS) is accurate, unbiased, and representative for bald

eagles, Indiana bats, and gray bats

7. uncertainty factors applied to toxicity values are appropriate

8. extrapolation of toxicity values from species to species is appropriate

9. no synergistic, additive, or antagonistic effects of stressors

10. acute and chronic toxicity values selected to derive TRVs were appropriate for all receptors

11.1.4 Risk Characterization

Risk characterization is a process of integrating exposure and effect relationships, and relating effects to receptor populations. A fundamental tool of risk characterization is the Hazard Quotient (HQ). We made the following assumptions regarding Hazard Quotients:

1. HQs are reliable and unbiased estimators of risk or unacceptable exposure

2. risks associated with HQs greater than 1 were considered significant impacts, but magnitudes of risks or impacts were not determined

11.2 UNCERTAINTY ANALYSIS AND DISCUSSION

All risk assessment include uncertainties. As part of estimating risks, uncertainties result, especially in predictive risk assessments. It is important to limit the number of uncertainties where possible, by basing the assessment on realistic, accurate, site-specific data. Most risk assessments involve the use of assumptions. These assumptions, based on best professional judgment, increase the degree of uncertainty of the risk assessment. Uncertainty can also result from:

• imperfect knowledge of ecosystem function and the ecological role of receptors

• failure to identify and temporally or spatially interrelate exposure

• incorrectly defining ecological effects to receptors from stressors

inaccurately addressing, recognizing, or characterizing secondary (indirect) effects

inadequately characterizing stressors

• the selection of inappropriate estimators of risks.

This ERA is predictive and was conducted to estimate risks from the purposed BRAC Action. Because it is predictive and the BRAC Action has not occurred, risks described within this document are based on assumptions, estimations, assertions, and predictions. The ERA supports the Environmental Impact Statement and Biological Assessment for the BRAC action at Fort Leonard Wood. Risks were determined for certain chemical stressors that will be

introduced as a result of the action. This ERA provides information about the potential for chemical stressors to affect receptors. It estimates the number of individuals that may be affected. Although it includes assumptions and other uncertainties, the ERA is a valuable predictive tool for decision makers.

Section 11.1 of this ERA presents assumptions made regarding stressors, receptors, toxicity values, and risk characterization. The following section describes uncertainty in the analysis resulting from use of these assumptions.

11.2.1 Stressors

The stressors evaluated for this ERA are obscurants (fog oil and terephthalic acid), simulants (biological and chemical), and non-specific simulants. Because these chemicals have not been used at Fort Leonard Wood, we could not collect empirical field data regarding their dispersion.

In the absence of comprehensive site-specific empirical data, we employed modeling in this analysis. We used the best technology available at reasonable cost to model stressor dispersion and concentration under various atmospheric stability categories. Modeling introduces uncertainty. Models used in this ERA are currently used by the military for their training. The air dispersion model (TREMS1) used in this assessment was developed by the military especially for obscurants. The dispersion of obscurants is affected by terrain and atmospheric conditions. It is not possible to predict the precise combinations of terrain and atmospheric conditions that will be present when obscurants are deployed. We modeled stressor dispersion under a variety of atmospheric stabilities and average terrain conditions. Assuming average terrain conditions may cause imprecise predictions of stressor concentrations at exposure points. The models also have other limitations that may affect their output. The TREMS1 air dispersion model is does not accurately predict stressor concentrations at distances less than 50 - 100 meters from the source. Exposure and resulting risk we predicted in these small areas may not be accurate.

The quantity, release mechanism, precise location, and number of stressor deployment events per year was estimated. Estimates are based upon the best available information. When definitive information was unavailable concerning the amount of stressor to be deployed

per unit time (or area), we based calculations upon the maximum amount of stressor (or least distant deployment site) expected. This approach, although appropriate when information was unavailable, is conservative and probably overestimates risks.

Certain stressors were eliminated from detailed analysis in this ERA because the screening risk assessment showed they would not affect receptors. The *screening risk assessment* was conducted using worst case scenarios for each stressor. Risks assessed in the *screening risk assessment* were intentionally overestimated to avoid erroneously eliminating stressors from detailed analysis. Exposure pathways for several chemicals in the screening risk assessment were incomplete. Additional analysis of these chemicals was not warranted. If the exposure pathways actually exist, and if risks result, we may have inappropriately underestimated risks.

The fate and transport of stressors in the environment was given consideration in assessing effects. We collected empirical data assessing the fate, and residence time of fog oil only in our studies completed at Fort McClellan. If stressors remain in the environment longer than predicted, risks associated with these stressors may be underestimated in our assessment.

Stressors may be released simultaneously during multiple training events. We did not address effects from multiple and/or simultaneous stressor releases. Our characterization of risks to these receptors may not have been fully assessed. Risks from all stressors except fog oil, TPA, and titanium dioxide, were based on the maximum quantity to be used at any location for any training event. Fog oil, TPA (grenades and smoke pots), and titanium dioxide have many possible release locations and training scenarios. While we assumed the maximum daily limit would be released from any one training location, we did not assessed effects to receptors that may repeatedly receive the maximum daily amount from two or more locations. Effects to receptors utilizing areas between TPA and titanium dioxide grenade locations training are not underestimated because we assumed all the grenades were released from each available deployment site per year. We were unable to accurately estimate the number of training events and number of grenades that will be used at each of 22 available locations. Predicted exposure to TPA and titanium dioxide is likely overestimated. The effects of fog oil were assessed based on the predicted amount of fog oil to be used at training locations.

Receptors between (in overlap areas) training locations may receive higher doses than predicted in this ERA.

There are uncertainties in our assessment of effects of TPA smoke pots. Receptors may be exposed to TPA from smoke pots and fog oil at the same time during certain training activities. Smoke pots are currently used by the military to fill in gaps in incomplete fog oil smoke screens. The combined toxicity of fog oil and TPA may be different than the separate toxicity of each chemical. It is possible receptors may be more susceptible to acute or chronic toxicological effects from either chemical if they are simultaneously exposed to both. Additional studies are required to adequately characterize effects of exposure to multiple stressors.

Receptors may be exposed to more than one chemical stressor during their lifetime, but these exposures and resulting effects can not be predicted with a reasonable level of certainty. It is beyond the scope of this analysis to predict these effects. This analysis would require information not currently available, including the number and frequency of exposure to each stressor. Risks to certain receptors may be underestimated in this ERA.

11.2.2 Receptors

Assessment endpoints of this ERA are listed by the federal government as endangered or threatened. When precise, site-specific information describing the proposed action or receptors was not available, we conservatively developed estimates (i.e. we included estimates that assume the proposed action will occur in a manner most likely to affect the listed species). For example, we assumed stressors would be deployed during the seasons receptors are present (e.g. if fog oil was going to be released 70 days per year, we assumed the releases would occur during the 7 months when Indiana bats hibernate on the Installation. This approach, necessitated when important information was not available, may overestimate actual exposure.

We estimated the exposure of receptors, including those involved in activities typical for the species, and sensitive life cycle stages. The estimated the amount of time receptor perform activities exposing them to stressors. Our estimates were based on the upper bound percentile rather than the average. For example, gray bats forage primarily along stream

corridors from approximately dusk until dawn. Many of the gray bats do not start foraging until dark and others do not finish foraging until early morning. To account for exposure to gray bats with the longest foraging times, we assumed foraging time was 12 hours per day. We used a similar approach in estimating the time sensitive life stages would be exposed to stressors. Intake parameters reflect the largest exposure each species/life stage could reasonably be expected to encounter. For example, we considered the entire surface area of the bald eagle egg as an exposure point. Realistically, the egg is sheltered by the nest and may be exposed to stressor deposition on only its upper surface. We did not account for stressors being removed from the surface of eggs when they are turned in the nest by adult eagles.

Where appropriate information was lacking, we made certain assumptions that could be considered "worst case." We assumed all the food receptors consumed on days when an exposure event occurred was contaminated. The assumed all of the stressor deposited on receptor's skin was absorbed. We assumed stressor that was ingested or inhaled was absorbed, rather than passed through receptor's body. Based on best professional judgment, we selected typical food sources for each receptor that would have the greatest amount of stressor on them. For example, we assumed bald eagles ate scaup on the days when stressors were deployed. This is an aquatic waterfowl that has a larger surface area and more potential to encounter greater concentrations of the stressor than a fish. These types of assumptions add uncertainty to the risk assessment, yet they are unavoidable.

Our effects determinations also involve uncertainty. Although we evaluated direct effects quantitatively, indirect effects were evaluated qualitatively. The biomonitoring plan to be developed by the installation will detect changes in the ecosystem at Fort Leonard Wood after the BRAC action. This plan will incorporate monitoring of endangered and threatened species populations as well as some of their primary prey populations. While this does not reduce the uncertainty, it will assist in preventing indirect effects incompletely characterized in this ERA.

11.2.3 Toxicity Values

There are unavoidable uncertainties associated with the toxicity assessment in this ERA. Because specific toxicity values were not developed for stressors and receptors, we

developed Toxicity Reference Values (TRVs) for each receptor. The TRV may not adequately represent a safe toxicity value for every individual receptor or sensitive life cycle stage. We applied Uncertainty Factors (UFs) to each TRV to develop toxicity values. Without specific toxicity testing of each receptor, or at least most sensitive life stages of the receptors (e.g. pregnant or gravid females), we can not quantify the uncertainty involved with application of Uncertainty Factors.

The toxicity values upon which we based TRVs may not be representative of receptors in this ERA, and the critical effects described may not be accurate. It is not known how well, for example, a rat (test species) represents a bald eagle. The two species may have different pharmacokinetics or pharmacodynamics. The bald eagle may be better able to rid itself of the stressor than the rat.

Available toxicity values may not adequately address all receptor life cycle stages. For example, a toxicity value developed for a rat may not account for a reduction in respiration through the interstitial spaces of a bald eagle egg. We do not know if the test species adequately represent the stressor response model for Indiana bats or gray bats. This area of uncertainty is common in risk assessments, and is unavoidable until receptor-specific testing is completed. We believe our application of UFs appropriately addresses this source of uncertainty.

11.2.4 Exposure Assessment

Uncertainties in the exposure assessment resulted from the lack of specific information and exposure point concentrations. Most of the exposure point concentrations were modeled, and therefore include uncertainty. Our characterization of stressor deployment involves estimates and uncertainty. Where site-specific information describing the location of deployment sites was lacking, our estimates may overestimate acute and chronic risks.

Intake parameters for each receptor were developed so receptors would receive the greatest dose realistically possible, given the training conditions at Fort Leonard Wood. We evaluated effects to receptors for different activities. Release of stressors may occur at times other than those when receptors are on the installation or performing certain activities, leading to overestimation of risk in this ERA.

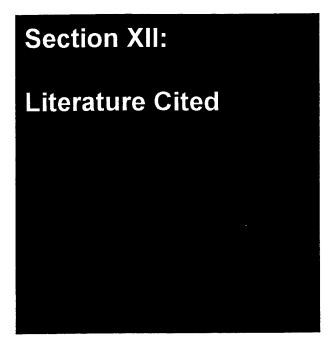
Exposure point concentrations in bat caves may not be accurate. We developed a specific air flow model for each cave that can be used to estimate the amount of time the chemical remains in the cave. The model may not correctly describe air flow inside the cave, or may not describe it accurately for all seasons.

11.2.5 Risk Characterization

The Risk Characterization step of any risk assessment involves uncertainties as it incorporates estimates and assumptions made in earlier assessment phases. The effect or risks were based on the ratio of intakes (calculated for each stressor and pathway) to toxicity values (assumed to be safe for the receptor). Risks for this ERA were based on Hazard Quotients (HQ) > 1. An HQ > 1 indicates the receptors are taking in more of the stressor than considered safe. The HQ is considered a point estimate. HQs only evaluate risks from one exposure concentration at a time. Chemical stressors not yet released would result in more than a single concentration. The HQs in this ERA were based on maximum exposure concentrations used in intake equations from the stressor source for receptors at stationary locations (e.g. hibernacula). HQs based on variable exposure points, where receptors have many possible locations, were determined at varying distances from the stressor source. HQs based on the maximum predicted exposure concentrations only reflect the risks to receptors for that concentration. They may overestimate the actual risk.

The HQ does not assist in estimating the number of receptors that may be at risk. Nor does it describe the effects that will occur when unsafe exposures occur.

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Attachment A
Training Materials to be Used at
Fort Leonard Wood

ATTACHMENT A:

Training Support
Materials to be Used
at Fort Leonard Wood

TABLE A-1. Training support materials to be used at Fort Leonard Wood as a result of the BRAC action. Materials were screened for potential risks to bald eagles, Indiana bats, and gray bats (receptors). Materials which could not be excluded were carried through a complete Ecological Risk Assessment (ERA).

ltem	Estimated Annual Quantity	Interior/ Exterior Use	Reason for Exclusion Following Primary Screening ¹	Exclusion Following Screening ERA ²	To be Examined in Future Studies ³	Analyzed in ERA
Military Police C						
Ethyl 2- cyanoacrylate	200 ounces	exterior	C,D			
BIDS Simulants						
Bacillus subtillus var. Niger	23 kg	exterior	NA	Yes		
Male Specific Coliphage (MS2)	180 mi	interior	NA	Yes		
Erwinia herbicola	180 ml	interior	NA	Yes		
Ovalbumin	180 mi	interior	NA	Yes		
Kaolin Dust (KD)	11 kg	interior and exterior	NA.	Yes		
FOX Simulants						
Anisole	30 ml	interior	NA	Yes		W8.44
Benzaldehyde	30 ml	interior	NA	Yes		

Item	Estimated Annual Quantity	Interior/ Exterior Use	Reason for Exclusion Following Primary Screening ¹	Exclusion Following Screening ERA ²	To be Examined in Future Studies ³	Analyzed ir ERA
Cyclohexanone	30 ml	interior	NA	Yes		
Diethyl malonate (DEM)	4.03 L	interior	NA	Yes		
Diethyl phthalate	1.2 L	interior	NA	Yes		
Dimethyl phthalate	60 ml	interior	NA	Yes		
Ethyl phthalate	30 ml	interior	NA	Yes		
Eucalyptol	6 L	interior	NA	Yes		
Isopropyi	18 ounces	interior	NA	Yes		
Methyl salicylate (MES)	30 ml	interior	NA	Yes		
Soman (GD), Sodium carbonate, polyethylene oxide, hydroxy ethyl cellulose, glycerol, diethyl malonate	1,800 L	exterior	NA	Yes		
Mustard - Lewisite (HL), Ferrous ammonium sulfate, polyethylene oxide, hydroxy ethyl cellulose, glycerol, methyl salicylate	1,800 L	exterior	NA	Yes		
Chemical Agent Disclosure Solution	1,800 pints	exterior	NA	Yes		
(CADS), 2,,2 Dipyridyl, phenolphthalein & isopropanol						
(CADS), 2,,2 Dipyridyl, phenolphthalein & isopropanol Toxic Agents						<u> </u>
(CADS), 2,,2 Dipyridyl, phenolphthalein & isopropanol Toxic Agents VX	300 ml	interior	C,D			
(CADS), 2,,2 Dipyridyl, phenolphthalein & isopropanol Toxic Agents	300 ml 200 ml 100 ml	interior interior interior	C,D C,D C,D			

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Item	Estimated Annual Quantity	Interior/ Exterior Use	Reason for Exclusion Following Primary Screening ¹	Exclusion Following Screening ERA ²	To be Examined in Future Studies ³	Analyzed in ERA
Radioisotopes						
All Radioactive Sources	millicurie and microcurie	interior and exterior	B,C,D			
Munitions						
Charge demo, C4, 11/4 lb (MO23)	13,005 units	exterior	NA	NA	Yes	
Thickening Compound, M4 (K917)	21,200 ounces	exterior	NA	NA	Yes	
CS (tear gas)	3500 capsules	interior and exterior	NA	NA	Yes	
Grenade Hand CS (tear gas)	5530	interior and exterior	NA	NA	Yes	
Grenade Hand Smoke, green	3875	exterior	NA	NA	Yes	
Grenade Hand Smoke, yellow	2350	exterior	NA	NA	Yes	
Grenade Hand Smoke, red	930	exterior	NA	NA	Yes	
Grenade Hand Smoke, violet	840	exterior	NA	NA	Yes	
Grenade Hand Smoke, M82, titanium dioxide	864	exterior	NA	No		Yes
Grenade Hand, fragmentation M67	48,216	exterior	A,D			
Illuminated Projectile Grenade	85	exterior	D			
Obcurant, Fog Oil	85,000 gallons	exterior	NA	No		Yes
Signal Illumination, green para	35	exterior	NA	NA	Yes	
Signal Illumination, red para	650	exterior	NA	NA	Yes	
Signal Illumination WS cluster	6280	exterior	NA	NA	Yes	
Signal Illumination, WS green star	510	exterior	NA	NA	Yes	

Item	Estimated Annual Quantity	Interior/ Exterior Use	Reason for Exclusion Following Primary Screening ¹	Exclusion Following Screening ERA ²	To be Examined in Future Studies ³	Analyzed in ERA
Signal	315	exterior	NA	NA	Yes	
Illumination RS cluster and RS para		v				
Simulated Hand Grenade (M116)	3980	exterior	NA	Yes		
Simulated Projectile Air Burst (M9)	90 each	exterior	C,D			
Simulated Projectile Ground Burst	3660	exterior	C,D			
Simulated Artillery Gun Flash	15	exterior	C,D			
Grenade Hand Smoke, M83, TPA	5534	exterior	NA	No		Yes
Smokepot M8 TA, TPA	1115	exterior	NA	No		Yes
Expended Motor Gasoline.	18,450 gallons	exterior	NA	NA	Yes	
Miscellaneous						
Acetone	47 L	interior	С			
Alkali Powder	100 lbs	exterior	B,D			
Aluminum oxide	10 g	interior	С			
Ammonia	96 ounces	interior	C			
Buffer solutions	800 ml	interior	С			
C-2 Mask canisters	7250	interior	A			
Calcium hypochloride	20,000 lbs	interior	C,D			
Carbon disulfide	30 ml	interior	B,C			
Charcoal, activated	200 g	interior	B,C			
Chloroform	50 mi	interior	B,C			
Chromosorb 10G	50 g	interior	В,С			
Corrosion Inhibitor, active ingredient = Dicyclohexal ammonium nitrite	64 ounces	exterior	C,D			
Cyclohexane	10 ml	interior	В,С			
_ <i>j</i> 0.0			- , -			

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	7					
	Estimated	Interior/	Reason for Exclusion	Exclusion	To be	
Item	Annual	Exterior	Following	Following	Examined	Analyzed in
1.0111	Quantity	Use	Primary	Screening	in Future	Analyzed in ERA
	Quantity	USE	Screening ¹	ERA ²	Studies ³	ERA
Dry Cleaning	3 bottles	intorios		ENA	Studies	
Solvent	3 bottles	interior	С		:	
DS-2	2670	interior				
100-2	2670	interior	С		-	
Eth an al	gallons					
Ethanol	1 L	interior	С			
FC-43,	10 ml	interior	B,C			
Fluorinert						
Gelbands	150 bands	interior	B,C			
Glass Wool	1 container	interior	C			
Hexane	100 ml	interior	B,C			
Hydro-chloric	100 ml	interior	C,D			
Acid			•			
Isopropyl	240 pints	interior	C,D			
Alcohol			٠,٠			
Isopropyl	150 ml	interior	C,D			
Amine			٠,٥			
M13 filters	1,500 sets	interior	C,D			
Megabore Test	10 ml	interior	B,C,D			
Mix	10 1111	michol	5,0,5			
Methanol	200 ml	interior	C,D			
Methyl chloride	50 ml	interior	B,C,D			
Mineral Oil	120 pints		C,D			
n-Amyl-acetate	4.7 L	interior				
Nitric Acid		interior	C,D	 		
Millio Acid	100 ml	interior	C,D			
PEG-200,	50 gallons	overing				
mixed with	30 gallons	exterior	D			
				1		
Butyl		1		İ		
mercaptan						
Potassium	5 ml	interior	C,D	1		İ
chloride					i	
solution						
Potassium	3 g	interior	C,D			
dichromate						
Potassium	60 g	interior	C,D			
fluoride						
Potassium	100 g	interior	C,D			
iodide						
Snoop Liquid	500 ml	interior	C,D			
Leak Detection					Í	İ
Sodium	200 g	interior	C,D			
bicarbonate					1	ĺ
Sodium	200 lbs	interior	C,D			
carbonate	j	I	·		}	ļ
(soda ash)			İ	1		i
Sodium	4,500	interior	C,D			
hypochlorite	galions		- ,			
Sodium	50 grams	interior	C,D			
thiosulfate			-,-	1		Ì
					···	

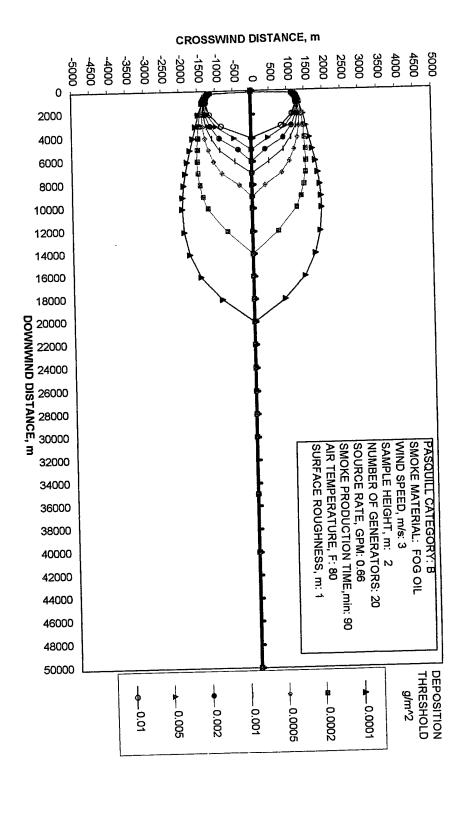
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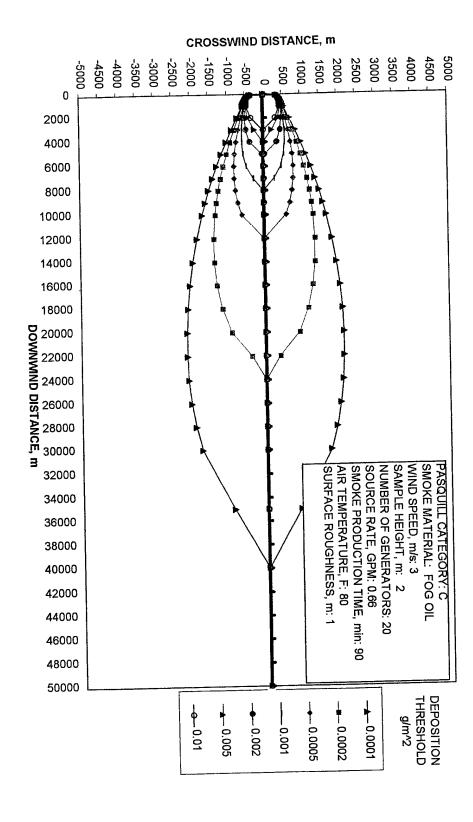
ltem	Estimated Annual Quantity	Interior/ Exterior Use	Reason for Exclusion Following Primary Screening ¹	Exclusion Following Screening ERA ²	To be Examined in Future Studies ³	Analyzed in ERA
Microcare Solvent Cleaner (BENESOLVE), contains: Dichloro- fluroethane, methal ash, Oleoethane, and Tetrafluoro- ethane (HFC)	18 cans	interior	C,D			
Stannic Chloride Tubes	2460 tubes	interior	C,D			
Sulphur	120 g	interior	C,D			
Sulfuric Acid	100 ml	interior	C,D			
Talc Powder	200 g	interior	C,D			
Tenax	10 g	interior	C,D			
Sodium hydroxide	250 lbs	interior	C,D			

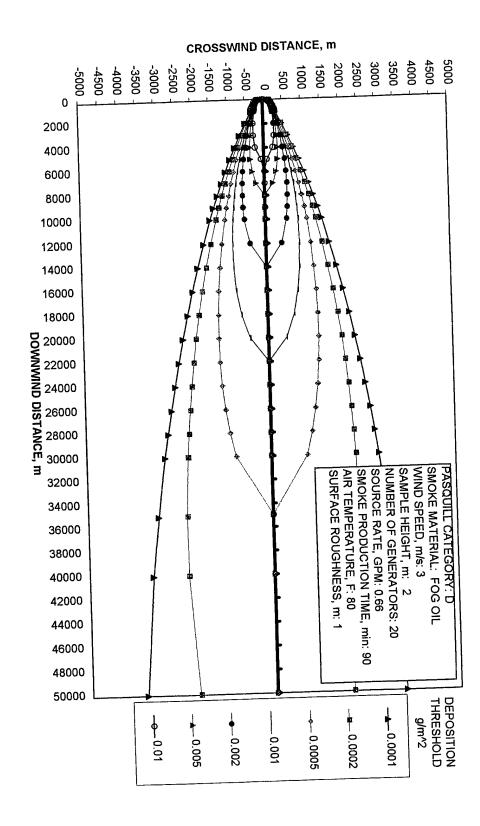
- 1. Primary screening analysis for training support materials included examination of the materials toxicity, quantity, location of use and storage (e.g., indoors only), and method of use or deployment (e.g., material contained). Letter designations that follow indicate reason for exclusion from further analysis:
 - A. material has no toxicity or low toxicity
 - B. quantity of material used is inadequate to pose potential risk
 - C. material storage and use locations minimize or eliminate contact with receptors
 - D. method of use or deployment does not pose potential risk to receptors
- 2. Materials examined in the Sreening Ecological Risk Assessment (ERA) were subject to broad-base assumptions with respect to material distribution, receptor exposure, and toxicity value. Only inhalation and ingestion exposure pathways were examined for the sreening ERA. Acute and chronic toxicity reference values (TRVs) were compared with estimated exposures. If estimated exposure concentration exceeded the TRV, the material was analyzed in the ERA.
- 3. Use of these materials will be episodic. Materials will be used at locations throughout the installation. Although exposure to substantial quantities of these materials may affect Indiana bats, gray bats, and bald eagles; proposed use of these materials is unlikely to adversely affect these species. A biomonitoring plan will be designed and implemented by Fort Leonard Wood to assess effects of these materials.

NA = Not Applicable

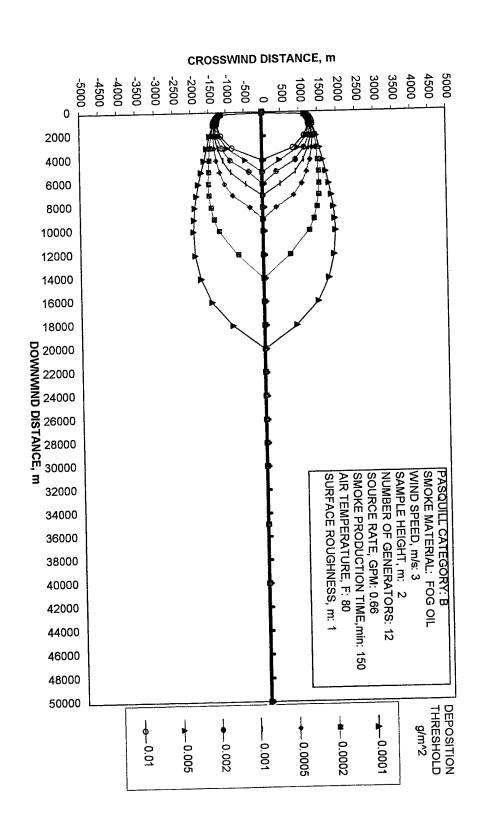
Attachment B Deposition Isopleths for Fog Oil (Pasquill Categories B, C, and D) THE SECTION OF THE PROPERTY OF

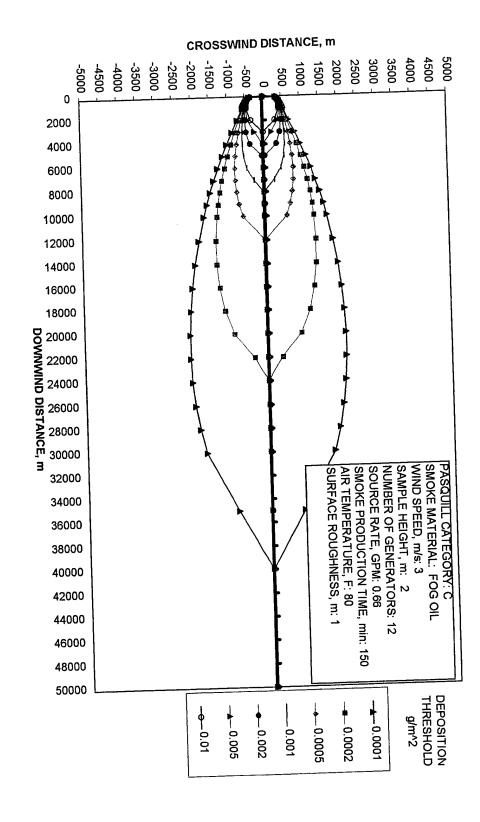


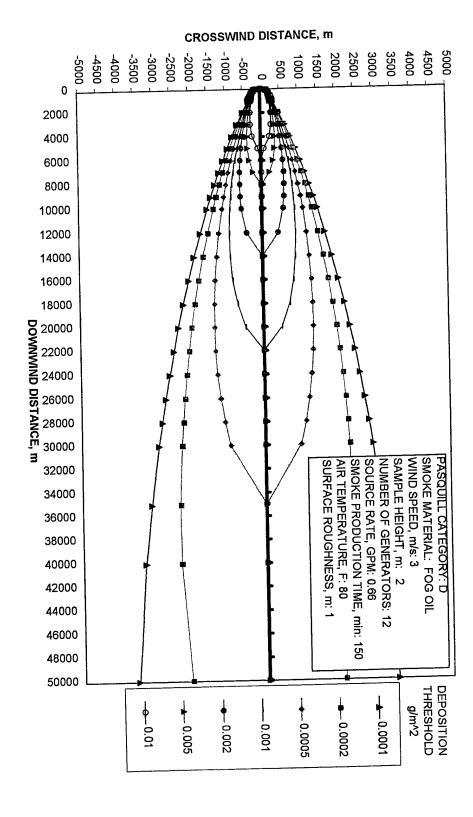












 $\{(i,j)\} \approx \sum_{i=1}^n \sum_{j=1}^n \sum_{i=1}^n (i,j) = \sum_{j=1}^n \sum_{i=1}^n \sum_{j=1}^n TERROR (2011)

Attachment C Stressor Intake - Indiana Bat

INTAKE PARAMETERS FOR INDIANA BATS

Summer Foraging/Roosting Inhalation

Parameter	Abbreviation	Definition
Distance		Number of meters from chemical source to exposure point.
Fog Oil Concentration		Exposure concentration.
Intake Rate		Amount of air inhaled.
Daily Intake Rate	Daily IR	Amount of air inhaled each day.
Hourly Intake Rate	Hourly IR	Amount of air inhaled each hour.
Event Intake Rate	Event IR	Amount of air inhaled during each chemical release.
Exposure Frequency	EF	Number of chemical exposures per year.
Exposure Duration	ED	Estimate of time receptor will potentially be exposed to chemical.
Body Weight	BW	Mass of adult receptor.
Averaging Time	AT	Lifespan of receptor.
Daily Chronic Intake Value		Amount of chemical stressor inhaled by receptor.

Summer Foraging/Roosting Ingestion

Parameter	Abbreviation	Definition
Distance		Number of meters from chemical source to exposure point.
Fog Oil Deposition		Exposure concentration.
Prey Surface Area	Prey SA	Size of area of the body surface of prey that might be covered by fog oil particles.
Prey Weight		Mass of prey.
Concentration of Food Contaminant	CF	Quantity of contaminant deposited on food item.
Intake Rate		Amount of food ingested during each chemical release.
Exposure Frequency	EF	Number of chemical exposures per year.
Exposure Duration	ED	Estimate of time receptor will potentially be exposed to chemical.
Body Weight	BW	Mass of adult receptor.
Averaging Time	AT	Lifespan of receptor.
Daily Chronic Intake Value		Amount of chemical stressor ingested by receptor.

Summer Foraging/Roosting Dermal Absorption

Parameter	Abbreviation	Definition
Distance		Number of meters from chemical source to exposure point.
Fog Oil Concentration		Exposure concentration.
Skin Surface Area		Surface area of receptor.
Absorption Factor	ABS	Degree of dermal absorption of stressor by receptor. Unitless - assumed to equal 1 (100% absorption).
Exposure Frequency	EF	Number of chemical exposures per year.
Exposure Duration	ED	Estimate of time receptor will potentially be exposed to chemical.
Body Weight	BW	Mass of adult receptor.
Averaging Time	AT	Lifespan of receptor.
Dermally Absorbed Dose		Amount of chemical stressor dermally absorbed by receptor.

Winter Hibernation Inhalation

Parameter	Abbreviation	Definition
Distance		Number of meters from chemical source to exposure point.
Fog Oil Concentration		Exposure concentration.
Intake Rate		Amount of air inhaled.
Daily Intake Rate	Daily IR	Amount of air inhaled each day.
Hourly Intake Rate	Hourly IR	Amount of air inhaled each hour.
Event Intake Rate	Event IR	Amount of air inhaled during each chemical release.
Exposure Frequency	EF	Number of chemical exposures per year.
Exposure Duration	ED	Estimate of time receptor will potentially be exposed to chemical.
Body Weight	BW	Mass of adult receptor.
Averaging Time	AT	Lifespan of receptor.
Daily Chronic Intake Value		Amount of chemical stressor inhaled by receptor.

Winter Hibernation Dermal Absorption

Parameter	Abbreviation	Definition
Distance		Number of meters from chemical source to exposure point.
Fog Oil Concentration		Exposure concentration.
Skin Surface Area		Surface area of receptor.
Absorption Factor	ABS	Degree of dermal absorption of stressor by receptor Unitless - assumed to equal 1 (100% absorption).
Exposure Frequency	EF	Number of chemical exposures per year.
Exposure Duration	ED	Estimate of time receptor will potentially be exposed to chemical.
Body Weight	BW	Mass of adult receptor.
Averaging Time	AT	Lifespan of receptor.
Dermally Absorbed Dose		Amount of chemical stressor dermally absorbed by receptor.

Attachment C: Fog Oil - Static Smoke

Indiana bat intake for fog oil under Pasquill Category B.

Static Smoke						_	_	-	-		
	Distance	Fog Oil Concentration	ntration	Inta	Intake Rate (m³/day)	ay)	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Daily Chronic Intak Value (g/kg-day)
	Œ.		1		01.4.10	Event 10					
			-	Daily IN	mounty in						
Summer Foraging/Roosting Inhalation	sting Inhalation				10 11	2 45 06		2.5	0.008	2555	2.6E-07
	4000			3.4E-04	1.45-05		7.4	2 6	0.008		
	4000	0.005		3.4E-04		2,15,05		3.5	0.008		5.1E-0
	2000			3.45-04	1.45-05		1.	3.6	0.00		2.6E-08
	2000	0.001		3.4E-04	1.4E-05			0.0	900.0		
	9009	0.0005	2	3.4E-04	1.4E-05	2.1E-05		3.5	0.00		
	8000	0.0002	6	3.4E-04	1.4E-05	2.1E-05	7.1	3.5	0.008	2002	3.15-03
	12000			3.4E-04	1.4E-05	2.1E-05		3.5	0.008		
	Distance	Deposition	Prey SA	Prey Weight	CF (q/g)	intake Rate (g/day)	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Daily Chronic Intake Value (g/kg-day)
	,		П		1						
Summer Foraging/Roosting Ingestion	osting Ingestion		20.00	2 45 03		2 5F+00	7.1	3.5	0.00		
	4000		0.50						0.00		
	2000		200	3.45-03	4 9F-05		7.1	3.5	0.008	8 2555	
	9009	0.002	30 25 0						0.008		
	0007		İ				7.1		0.008	8 2555	
	0006								0.008		
The second secon	14000		İ	2 4F_03					0.008		5 2.9E-06
	2000		3.35-03								
		1_									Dermally Absorbed
	Distance (m)	Fog Oil Concentration (g/m²)	centration (²)	Skin Surfac	Skin Surface Area (m²)	ABS	EF (days/yr)) ED (yrs)	BW (kg)	AT (days)	
							+				
Summer Foraging/Roosting Dermai Absorption	oosting Dermai	- 1			0000		1.7				
	4000	2000	7	i c	0.022		1 7.1	3.5	0.008	38 2555	
	500		3 5	İ	0.00		1 7.				
	2000		7 7	Ö	0.022		1 7.1				2.7E-05
	8 8		35	0	0.022		1 7.				
	1400		3	o	0.022		1 7.			Ì	55 5.35-06
	0000		Ę	0	0.022		1 7.				
	2007										
				Į	-		-	_	_	-	

Indiana bat intake for fog oil under Pasquill Category B.

	Distance	Fog Oil Concentration								
	Ē	(g/m³)	Ĭ	Intake Rate (m³/day)		FF (dameter)	1	i	. ;	Daily Chronic Intake
			Daily fR	Hourty 1D	91.91	(1/2)	•	DW (Kg)	AT (days)	Value (g/kg-day)
Winter Hiberation Inhalation	ation			and in the	EVEIR IR					
Brooks	6037	0.0002	3 45 04	10.01						
Davis #2			5		3.85-06	7.1	4.7	0.008	2555	4 20 00
MAN Dan	-	0.0	3.4E-04	į	1.5E-05	7.1	47	0000		1.ZE-U9
woil Den	38/8		3.4E-04		100.00		;	9000		2.5E-07
Joy		0.01	2 45 04		200	1.	4.7	0.008	2555	1 7E-07
			10.1	1.4E-US	1.2E-05	7.1	4.7	0.008		206.07
										4.01.70
								,		
	Distance	Fog Oil Concentration								
	Ê	(g/m²)	Skin Surface Area (m²)	Area (m²)	908					Dermaily Absorbed
					1	Er (days/yr)	ED (yrs)	BW (kg)	AT (days)	Dose (a/ka-dav)
Winter Hibernation Dermal Absorption	nal Absorption									,
Brooks	6037	0.001	- 6	2						
Davis #2	3927		0.022	7 9	-	7.1	4.7	0.008	2555	3 6E.05
Wolf Den	3878		0.02	7	-	7.1	4.7	0.008	2555	20.0
vol.	3682	10.0	0.02	2	-	7.1	4.7	8000	2555	3.05-04
,	7		0.022		-	7.1	1.7	2000	2002	3.6E-04
The second secon							Ť	0.008	2555	3.6E-04
				-						
	-		1	-						
						_				

Indiana bat intake for fog oil under Pasquill Category C.

Distance Frag Oil Concentration Frag Oil Frag O	Static Strong			_			_	_			_	
Deliy IR Hourly IR Event IR		Distance	Fog Oil Conce	ntration	Inta	ke Rate (m³/d	(Au	EF (days/yr)	ED (yrs)	BW (kg)		Daily Chronic Intake Value (g/kg-day)
Control						Hounty IR	Event IR					
Continue					+	-						
Second Control Contr	er Foraging/RO	Sting innaiation			2.4E-04	1 4F-05	2.1E-05		3.5	0.008		2.6E-C
1		0000			3 AE 04	1 45-05	2.1E-05		3.5	0.008		
10 1 1 1 1 1 1 1 1 1		Once			3.4E.04	1 4F-05	2.1E-05		3.5	0.008		
1,000		4000			20.45	4 46 06	2 15.05		3.5	0.008		
12000 0.0005 3.4E-04 1.4E-05 2.1E-05 7.1 3.5 0.008 2.855 2.255 2		2200			3.45-04	-4-05 -14-05	2.11.05		3.5	000		
15000 0.0002 3.4E-04 1.4E-05 2.1E-05 7.1 3.5 0.009 2565 2.2E-05 2.1E-05 7.1 3.5 0.009 2565 2.2E-05 2.2		7500		_	3.4E-04	1.4E-05	2.15-05		200	9000		
15500 0.0001 3.4E-04 1.4E-05 2.1E-05 7.1 3.5 0.1008 2.000		12000		·	3.4E-04	1.4E-05	2.1E-05		0	0.000		
Fog Oil Pray SA Pray Weight Pray SA Pray Weight Pray SA Pray Weight Pray SA Pray Weight Pray SA Pray Weight Pray SA Pray Weight Pray SA Pray Weight Pray SA Pray Weight Pray SA Pray Weight Pray SA Pray Weight Pray SA Pray Weight Pray SA Pray Weight Pray SA Pray Weight Pray SA Pray Weight Pray SA Pray Weight Pray SA Pray SA Pray Weight Pray SA Pray Weight Pray SA Pray S		18500			3.4E-04	1.4E-05	2.1E-05		3.5	8000		
Frog Oil Frog Oil Frog SA Prey Weight Figure Prog Sa Prey Weight Figure Prog Sa Prey Weight Figure												
tenne Deposition (g/m²) (m²) (pqqqy) Intake Rate (g/m²) Intake Rat			Fog Oil									
1989 1980		Distance (m)	Deposition (a/m²)	Prey SA (m²)	Prey Weight (g)	CF (9/9)	Intake Rate (g/day)	EF (days/yr)	1	BW (kg)	AT (days)	
National Augustion 13E-05 3.4E-03 3.7E-05 2.5E+00 7.1 3.5 0.008 2.555 2.5E-00 7.1 3.5 0.008 2.555 2.5E-00 7.1 3.5 0.008 2.555 2.5E-00 7.1 3.5 0.008 2.555 2.5E-00 7.1 3.5 0.008 2.555 2.5E-00 7.1 3.5 0.008 2.555 2.5E-00 0.0001 3.3E-05 3.4E-03 3.7E-05 2.5E-00 7.1 3.5 0.008 2.5E5 2.5E-00 0.0002 3.3E-05 3.4E-03 3.7E-05 2.5E-00 7.1 3.5 0.008 2.5E5 2.5E-00 0.0002 3.3E-05 3.4E-03 3.7E-05 2.5E-00 7.1 3.5 0.008 2.5E5 2.5E-00 0.0002 3.3E-05 3.4E-03 3.7E-07 2.5E-00 7.1 3.5 0.008 2.5E5 2.5E-00 0.0001 3.3E-05 3.4E-03 3.7E-07 2.5E-00 7.1 3.5 0.008 2.5E5 2.5E-00 0.0001 3.3E-05 3.4E-03 3.7E-07 2.5E-00 7.1 3.5 0.008 2.5E5 2.5E-00 0.0001 0.0002 0												
3500 0.01 3.84-03 3.74-05 2.55-00 7.1 3.5 0.008 2.55-0 6x00 0.002 3.84-03 3.74-05 2.55-00 7.1 3.5 0.008 2.55-0 5500 0.002 3.84-03 3.74-05 2.55-00 7.1 3.5 0.008 2.55-0 12000 0.002 3.84-03 3.74-05 2.55-00 7.1 3.5 0.008 2.55-0 24000 0.0002 3.84-03 3.75-05 2.55-00 7.1 3.5 0.008 2.55-5 40000 0.0001 3.84-03 3.75-05 2.55-00 7.1 3.5 0.008 2.55-5 40000 0.0001 3.85-05 3.45-03 3.75-07 2.55-00 7.1 3.5 0.008 2.55-5 40000 0.0001 3.85-05 3.45-03 3.75-07 2.55-00 7.1 3.5 0.008 2.55-5 4000 0.001 3.85-05 3.45-03 3.75-03 3.75-03	ner Foraging/Rc	5				10 15	20.00					
4000 0.005 3.8E-05 3.4E-03 4.9E-09 7.1 3.5 0.008 2.55 8500 0.001 3.8E-05 3.4E-03 3.4E-03 3.7E-06 2.5E-00 7.1 3.5 0.008 2.555 8000 0.001 3.3E-05 3.4E-03 9.7E-07 2.5E-00 7.1 3.5 0.008 2.555 24000 0.0001 3.3E-05 3.4E-03 9.7E-07 2.5E+00 7.1 3.5 0.008 2.555 24000 0.0001 3.3E-05 3.4E-03 9.7E-07 2.5E+00 7.1 3.5 0.008 2.555 24000 0.0001 3.3E-05 3.4E-03 9.7E-07 2.5E+00 7.1 3.5 0.008 2.555 24000 0.0001 3.3E-05 3.4E-03 9.7E-07 2.5E+00 7.1 3.5 0.008 2.555 24000 0.0001 0.001 0.001 0.002 0.002 0.003 2.555 24000 0.002 0.		3200		3.3E-05		-						
5500 0.002 3.8E-05 3.4E-03 1.5E-06 2.5E-00 7.1 3.5 0.008 2.555 12000 0.001 3.3E-05 3.4E-03 9.7E-06 2.5E+00 7.1 3.5 0.008 2.555 24000 0.0005 3.3E-05 3.4E-03 1.9E-06 2.5E+00 7.1 3.5 0.008 2.555 40000 0.0001 3.3E-05 3.4E-03 1.9E-06 2.5E+00 7.1 3.5 0.008 2.555 40000 0.0001 3.3E-05 3.4E-03 1.9E-06 2.5E+00 7.1 3.5 0.008 2.555 40000 0.0001 3.3E-05 3.4E-03 1.9E-06 2.5E+00 7.1 3.5 0.008 2.555 4000 0.0001 Skin Surface Area (m²) ABS EF (dayslyr) ED (yrs) AT (days) AT (days) AT (days) Dose (gl/k) 12000 0.001 0.002 0.002 0.002 1.7 7.1 3.5 0.008 2.555 <td></td> <td>4000</td> <td></td> <td>3.3E-05</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>		4000		3.3E-05								
Stance Coord 3.3E-05 3.4E-03 4.9E-05 2.5E-00 7.1 3.5 0.008 2.555		2500		3.3E-05								
1,000 0,0005 3,3E-05 3,4E-03 1,9E-06 2,5E+00 7,1 3,5 0,008 2,5E5 4000		8000		3.3E-05								
Skin Surface Area (m²) 3.15-05		12000		1								
40000 0.0001 3.3E-05 3.4E-03 9.7E-01 2.5E-00 1.0 1		24000		. 1								
Fog Oil Concentration Skin Surface Area (m²) ABS EF (days/yr) ED (yrs) BW (kg) AT (days) Doese (g/kg)		40000										
stance (m) Fog Oil Concentration (gm²) Skin Surface Area (m²) ABS EF (days/yr) ED (yrs) BW (kg) AT (days) Does (g/ks) Demail Absorption Demail Absorption Skin Surface Area (m²) ABS EF (days/yr) ED (yrs) BW (kg) AT (days) Does (g/ks) 3500 0.01 0.022 1 7.1 3.5 0.008 2855 4000 0.005 0.022 1 7.1 3.5 0.008 2855 8000 0.001 0.002 1 7.1 3.5 0.008 2855 8000 0.007 0.022 1 7.1 3.5 0.008 2855 2400 0.0005 0.0022 1 7.1 3.5 0.008 2855 4000 0.0002 0.0022 1 7.1 3.5 0.008 2855 4000 0.0002 0.0022 1 7.1 3.5 0.008 2855 4000 0.0002 0.0022 1 7		1										
Page Fog Oil Concentration Skin Surface Area (m²) ABS EF (days/yr) ED (yrs) BW (kg) AT (days) Doses (g/ks) Doses (g/ks)											-	
stance (m) Fog Oil Concentration (g/m²) Skin Surface Area (m²) ABS EF (days/yr) ED (yrs) BW (kg) AT (days) Doesnell/Ab Demail Absorption Cold 0.072 1 7.1 3.5 0.008 2555 3500 0.002 0.002 1 7.1 3.5 0.008 2555 5500 0.002 0.002 1 7.1 3.5 0.008 2555 8000 0.001 0.002 1 7.1 3.5 0.008 2555 12000 0.002 0.002 1 7.1 3.5 0.008 2555 12000 0.0001 0.002 1 7.1 3.5 0.008 2555 24000 0.0002 0.0022 1 7.1 3.5 0.008 2555 24000 0.0002 0.0022 1 7.1 3.5 0.008 2555 40000 0.0001 0.0002 0.0002 0.0002 0.0008 2555												
Dermal Absorption Comman Absorption		Distance		centration	Skin Surfac	se Area (m²)	ABS	EF (days/yr		BW (kg)	AT (days	
Dermail Absorption Dermail Absorption 1 7.1 3.5 0.008 2955 3500 0.01 0.002 1 7.1 3.5 0.008 2555 5500 0.002 0.022 1 7.1 3.5 0.008 2555 5500 0.002 0.022 1 7.1 3.5 0.008 2555 8000 0.001 0.002 1 7.1 3.5 0.008 2555 2400 0.0005 0.002 1 7.1 3.5 0.008 2555 4000 0.0001 0.0022 1 7.1 3.5 0.008 2555 4000 0.0001 0.0022 1 7.1 3.5 0.008 2555												
0.001 0.022 1 7.1 3.5 0.008 2856 0.005 0.022 1 7.1 3.5 0.008 2856 0.007 0.022 1 7.1 3.5 0.008 2856 0.007 0.002 0.022 1 7.1 3.5 0.008 2856 0.0005 0.002 1 7.1 3.5 0.008 2856 0.0001 0.002 1 7.1 3.5 0.008 2856 0.0001 0.002 1 7.1 3.5 0.008 2856	mer Foraging/R		- 1		l	- 62		1 7				
0.005 0.022 1 7.1 3.5 0.008 2555 0.002 0.022 1 7.1 3.5 0.008 2555 0.0005 0.022 1 7.1 3.5 0.008 2555 0.0005 0.022 1 7.1 3.5 0.009 2555 0.0007 0.022 1 7.1 3.5 0.008 2555 0.0001 0.022 1 7.1 3.5 0.008 2555		3500			5 6	770		7				
0.002 0.022 1 7.1 3.5 0.008 2555 0.001 0.022 1 7.1 3.5 0.008 2556 0.0005 0.022 1 7.1 3.5 0.008 2556 0.0001 0.022 1 7.1 3.5 0.008 2556 0.0001 0.022 1 7.1 3.5 0.008 2556		400		2	5 6	770		7				
0.0005 0.022 1 7.1 3.5 0.008 2555 0.0005 0.022 1 7.1 3.5 0.008 2555 0.0001 0.022 1 7.1 3.5 0.008 2555 0.0001 0.022 1 7.1 3.5 0.008 2555		920		2 2	s C	022		7				
0.0001 0.022 1 7.1 3.5 0.008 2555 0.0001 0.022 1 7.1 3.5 0.008 2555		500			6	022		1 7.				
0,0001 0,022 1,7,1 3,5 0,008 2,855		2400		00	0	022		1 7.			ĺ	
		0004		01	Ö	022		1 7.				
										-		

TO SEE STATE OF THE SECOND SEC

Indiana bat intake for fog oil under Pasquill Category C.

	Distance	Fog Oil Concentration								
	Œ									
			=	Intake Rate (m'/day)		EF (davs/vr)	ED (1979)			Daily Chronic Intake
A.C			Daily IR	House ID	Г			OW (Kg)	AT (days)	Value (a/kgday)
villier Filberation Inhalation	lation			111	YI MAS					1000
Brooke										
Conce		0.0005	3.4F-04	1 AE OF	1000					
Davis #2	3927	0 00				7.1	4.7	8000		
MON HOW	L		477	1.4E-05	1.55.05	7.4	!	2000		3.15-09
TO TOA		0.002	3 45.04			-	4.7	0.008	2555	
yof			5		1.0E-05	7.1	4.7	000		
	-		3.4E-04	1.4E-05	1 2E.06			0.000		3.45-08
		_				Ţ.	4.7	0.00	2555	100
										3.91=-08
	i									
	Distance	rog Oil Concentration				•				
	Œ	(g/m²)	Skin Surface Area (m2)	Area (m.2)						
					ABS	EF (days/yr)	ED (yrs)	BW (kg)	AT (daye)	Decimality Absorbed
Winter Hibernation Dermal	nal Absorption								(Maya)	Dose (g/kg-day)
d										
Drooks	į	0.001	ò	2						
Davis #2	3927	0.005	0.022	7	-	7.1	47	000	1000	
MAKE		200.0	0.0		-	,		200	9007	3.6E-05
WOII DAY	38/8	0.005	0.022	2		5	4.7	0.008	2555	1 85 04
Joy		0.005	0.000	1 2		7.1	4.7	0.008	2555	יים ויים
			0.0	7	-	7.1	47	900	3	1.0E-04
								0.00	2555	1.8E-04
				-						

	L		-						•	-	
	Distance	Fog Oil Concentration	ntration	Inta	Intake Rate (m³/day)		EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Daily Chronic Intake Value (g/kg-day)
	Ē	(Burn)	1	01.11.0	Ol where	Vent IR					
			+	Cally In	TIONE IN						
Summer Foraging/Roosting In	_		1		,	20 11	7.4	3.5	0.008	2555	2.6E-07
	3200	0.01		3.45-04	1.45-03	2.15-03		0 0	800	2555	1.3F-07
	4500	0.005		3.4E-04	1.4E-05	2.1E-05		0.0	0.00		A 1E.08
	6500	0.002		3.4E-04	1.4E-05	2.1E-05		3.5	0.008		3.15-00
	2000	5000		3.45-04	1.4E-05	2.1E-05		3.5	0.008		2.6E-08
	0000	1000		3.4F_04	1.4E-05	2.1E-05	7.1	3.5	0.008		1.3E-08
	12500	0.000		2.46.04	1 4F-05	2.1E-05		3.5	0.008		5.1E-09
	22500	0.0002		2 4	4 46 06	2 1E-05		3.5	0.008	2555	2.6E-09
	35500	0.0001		3.45-04	-14E-05	2.15-03					
		Fog Oil									
	Distance (m)	Deposition (a/m²)	Prey SA (m²)	Prey Weight (g)	CF (9/g)	Intake Rate (g/day)	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Daily Chronic intake Value (g/kg-day)
		1									
Summer Foraging/Roosting	Ξ		1		0 77 0	007336	7.1	6	0.008	2555	2.9E-04
	ì	0.0	3.3E-05						0.008	2555	1.5E-04
	8500		3.35-05	3.46-03					0.00		5.9E-05
		0.002	3.35-03	-					0.00	3 2555	2.9E-05
	22000		3.35-05					3.5	0.008	3 2555	1.5E-05
	35500	1	3.35-03	3.45-03					0.008	3 2555	
	+00005	0.0002	3.35-03						0.008	3 2555	2.9E-06
	++00005	0.0001	3.3E-U0								
										_	
	Distance	Fog Oil Concentration	entration	Skin Surfac	Skin Surface Area (m²)	ABS	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Dose (g/kg-day)
		2									.
Summer Foraging/Roosting	osting Dermal A	Dermal Absorption					F	30	800.0	8 2555	2.7E-04
				Ö	0.022		- 1				
	8200		5	Ö	0.022						
	14000		2	Ö	0.022		.,,				
	22000		-	Ö	0.022		7.4				1.3E-05
	35500		35	0	0.022		7.1				5 5.3E-06
	\$0000÷		22	١	770		7.4				5 2.7E-06
	++00005	0.0001	5	o	0.022		-				
					-			-		_	

Indiana bat intake for fog oil under Pasquill Category D.

		_								
•	Distance	Fog Oil								
	(illi)	(a/m,)	Intake	Intake Rate (m3/dav)		EE (dame has		i		Daily Chronic Intak
			Daily IR	Hounds 10		(14 A)	EU (yrs)	BW (kg)	AT (days)	AT (days) Value follon-days
Winter Hiberation Inhalation	rtion		+	Al filling	EVent IR					(Apr. Gu.S.)
Brooke										
	3		3.4E-04	1.4F.05	2 20 6					
Davis #2	3927	0.005	2.45.04		9-10.0	-	4.7	800.0	JEKE	
Wolf Dan	2070		0.40	-4-02 -03	1.5E-05	7.1				6.2E-09
	0000	0.005	3.46-04	1.4F-05	4 00 00		7	0.008	2555	1.35-07
Joy	3682	0.005	3.4E-04	4 45 00	3	Ţ.	4.7	0.00		
			5	1.45-03	1.2E-05	7.1	47	900		8.DE-08
								0.00	2002	9.8E-08
				-				_		
				+						
						-				
									_	
	Distance	Fog Oil Concentration								
	Œ	(g/m²)	Skin Surface Area (m²)							Darmelly About
					Sas	Er (days/yr)	ED (yrs)	BW (kg)	AT (daye)	Decine of Australia
Winter Hibernation Dermal Absorption	al Absorption							T		Dose (g/kg-day)
Brooks	1000					1	1			
e coord	j	0.01	0.000		1				-	
Davis #2		0.01	2000		-	7.1	4.7	0.00	2555	1000
Wolf Den	3878	100	0.022		-	7.1	4.7	9000	200	3.05-04
100			0.022	_	-	7.4	1	8	2002	3.6E-04
6	2000	0.01	0.022	-	-	1	,	0.008	2555	3.6E-04
					-	-	4.7	0.008	2555	365-04
	:			-						
						_			1	

Indiana bat intake for fog oil under Pasquill Category E.

Office Chicago											
	Distance	Fog Oil Concentration	ntration				7	[OW (to)	AT (dave)	Daily Chronic Intake
	Ē	(g/m³)		Inta	Intake Rate (m*/day)	lay)	EF (days/yr)	ED (yrs)	DAN (VB)	Ai (uaya)	-1-
				Daily IR	Hourly IR	Event IR					
Summer Foraging/Roosting Inhalation	sting Inhalation										20 20 0
	4000	0.01		3.4E-04	1.4E-05	2.1E-05		3.5	0.008		
	2000	0.005		3.4E-04	1.4E-05	2.1E-05		3.5	0.008		
	0006	0.002		3.4E-04	1.4E-05	2.1E-05		3.5	0.00		
	44000	0000		3.4E-04	1.4E-05	2.1E-05			0.008		
	24000	0.0005		3.4E-04	1.4E-05						
	0000	20000		3.4E-04	1.4E-05	2.1E-05					
	+00005	0.0001		3.4E-04	1.4E-05		7.1	3.5	0.008	8 2555	2.6E-09
										_	
		Fog Oil Denosition	Prev SA	Draw Weight		Intake Rate					Daily Chronic Intake
	Uistance (m)	(g/m²)	(m²)	(g)	CF (g/g)	(g/day)	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
Summer Foraging/Roosting	osting Ingestion										2000
		0.01	3.3E-05	3.4E-03	9.7E-05		İ				
and the second s	10000		3.3E-05	3.4E-03	4.9E-05		7.1				
	18000		3.3E-05	ļ		2.5E+00					5 5.9E-05
	2000		3.3F-05				7.1				
	0000		3.3E-05		<u> </u>		7.1	3.5			
	+0000		3.3E-05		1.9E-06		7.1				
	++00005	100001	3.3E-05				7.1		0.008	38 2555	2.9E-06
		For Oil Concentration	entration								Dermally Absorbed
	Uistance (m)	(9/m²)	_	Skin Surfac	Skin Surface Area (m²)	ABS	EF (days/yr)	r) ED (yrs)	BW (kg)	AT (days)	s) Dose (g/kg-day)
Summer Foraging/Roosting		bsorption						2.6	8000	2555	2.7E-04
	7500			Ö	0.022			2 6			
	10000			ő	0.022						
	18000		2	Ö	0.022						
	30000			o	0.022						
	20000		35	o	0.022						
	+00009	+ 0.0002	2	0	0.022		1.7				
	\$0000+	+ 0.0001	=	O	0.022		1 7.1	3.5	0.008	5552	
										+	
										1	
										_	_

· Indiana bat intake for fog oil under Pasquill Category E.

_	Distance	For Oil Concentration								
	(m)	Car Concentiation								
		(g/m²)	Ē	Intake Rate (m3/day)		FF (dave hor)				Daily Chronic Intake
			Daily ID	1		like (ma)	CD (yrs)	BW (kg)	AT (davs)	Value follogist
Winter Hiberation Inhalation	ation		VIII ŽIIII I	mounty IR	Event IR					(Apr. Rugh)
Brooks	6037	2000	1, 0	ĺ						
Davis #2			3.41-04	-	3.8E-06	7.1	47	0000		
Mak Dan			3.4E-04	1.4E-05	1.55.05		: :	0,000		1.2E-08
IIIO IIOA		0.01	3.4E-04	ľ			4./	0.008	2555	2 SE.07
Joy	3682	001	20.00	20-1		7.1	4.7	8000		Z.3E-0/
			3.4E-04	1.4E-05	1.2E-05	7.1	47	0000	2000	
								0.000		2.0E-07
	Dietanos	For Oll Contraction								
	E (E)	formation in So.	0	•				•		
		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	OKIN SUITACE Area (m²)	Area (m.)	ABS	EF (days/yr)	ED (vrs)	RW (km)	AT 1.1	Dermally Absorbed
Winter Hibernation Demat Absorption	at Absorption							1	A (days)	Dose (g/kg-day)
	ימותוחפת ופי									
Brooks	6037	0.01	6							
Davis #2	3927	000	0.022	7	-	7.1	4.7	8000	2000	
Wolf Dan			0.022	2	-	7.1	1,	3	6007	3.6E-04
100	0000	0.01	0.022	2			7	0.008	2555	3.6F-04
you	3682	0.01	0.000	2		(.1	4.7	0.008	2555	3.65.04
						7.1	4.7	0.008	2555	3.65-04
	_									2000
						-				
									_	

.

Attachment C: Fog Oil - Mobile Smoke

Indiana bat intake for fog oil under Pasquill Category B.

Summer Foreging Private Continue Conti	Mobile Smoke			1								
Continue Continue		Distance	Fog Oll Conc.	antration	j	. (-)	<u> </u>	EE (dayshe)	(ac)	(5) WB	AT (dave)	Daily Chronic Intake
Control Cont		Ē	E/6)			Mounty IR	Event IR	fide foot	(1)	R	(2)	(G
Continue	or Quarter Const.	action toholothon										
Continue	Summer rotaging/Not	4000			3.4E-04	1.4E-05	3.5E-05			0.008		1.5E-06
Control Cont		4000			3.4E-04	1.4E-05	3.5E-05			0.008		7.6E-07
Control Cont		4000			3.4E-04	1.4E-05	3.5E-05			0.008		3.0E-07
0.0005 3.4€-04 1.4E-05 3.5E-05 25.3 3.5 0.000 2565 0.000 2565 0.000 2.000 2.000 2.000 2.000 2.000 0.000 2.0		2000			3.4E-04	1.4E-05	3.5E-05			0.008		1.5E-07
1		2000		_	3.4E-04	1.4E-05	3.5E-05			0.008		
PSG OII		7000		~	3.4E-04	1.4E-05	3.55-05			0.008		
Program Prey SA Prey Weight CF (g/g) Intake Rate C (g/g) Intake Rate C (g/g) CF (g/g) Intake Rate C (g/g) CF		0006			3.4E-04	1.4E-05	3.5E-05			0.008		1.5E-08
Pag OII												
Post Office Party SA												
Pag OII												
Program Prog												
Girm')		Distance	Deposition	Prey SA	Prey Weight		Intake Rate]	1	7.1	Daily Chronic Intake
Court Cour		Ē	(m/g)	Ē	6	(6/6)	Dally IR	Er (daysyr)	50 (318)	(Ru) AAO	(ada) (V	(Sup Sup)
Court Cour	ood) ralassa Commission	tollescol police										
0.005 0.0000 0.00 4.9E-06 2.5E+00 25.3 3.5 0.006 2555 0.000 0.001 2.5E-00 2.5E+00 2.5.3 3.5 0.008 2555 0.000 0.001 3.E-06 2.5E+00 2.5.3 3.5 0.008 2555 0.000 0.00 0.00 0.00 0.00 0.00 0.0	Sommer Colagnigator	4000			00.00		2.5E+00			0.008		1.1E-03
0.002 0.000 0.00 1.9E-06 2.5E+00 25.3 3.5 0.008 2565 0.0001 0.0001 0.000 0.00 3.7E-06 2.5E+00 25.3 3.5 0.0008 2565 0.0001 0.0002 0.00 0.00 0.00 0.00 0.00		2000			000					0.008		5.3E-04
0.001 0.000 0.00 9.7E-06 2.5E+00 25.3 3.5 0.008 2565 0.0000 0.00 1.9E-06 2.5E+00 25.3 3.5 0.008 2565 0.0001 0.000 0.00 9.7E-07 2.5E+00 25.3 3.5 0.008 2565 0.0001 0.0001 0.000 0.00 9.7E-07 2.5E+00 25.3 3.5 0.008 2565 0.0001 0.		0009			00.0					0.008		2.1E-04
0.0005 0.0000 0.000 4.9E-06 2.5E+00 25.3 3.5 0.000 2565 0.0001 0.000 0.00 9.7E-07 2.5E+00 25.3 3.5 0.008 2565 0.0001 0.000 9.7E-07 2.5E+00 25.3 3.5 0.008 2565 0.0001 0.0000 9.7E-07 2.5E+00 25.3 3.5 0.008 2565 0.0001 0.0000 0.0000 9.7E-07 2.5E+00 25.3 3.5 0.008 2565 0.001 0.002 0.022 1 25.3 3.5 0.008 2565 0.002 0.002 0.022 1 25.3 3.5 0.008 2565 0.001 0.002 0.002 1 25.3 3.5 0.008 2565 0.002 0.002 1 25.3 3.5 0.008 2565 0.0001 0.002 1 25.3 3.5 0.008 2565 0		7500	ļ		0.00					0.008		1.1E-04
0.0002 0.000 0.00 1.9E-06 2.5E+00 2.5.3 3.5 0.008 2.565 0.0001 0.000 9.7E-07 2.5E+00 2.5.3 3.5 0.008 2.565 0.0001 0.000 9.7E-07 2.5E+00 2.5.3 3.5 0.008 2.565 0.01 SkIn Surface Area (m²) ABS EF (dayabyr) ED (yrs) BW (kg) AT (days) Dose (g/kg) 0.01 0.022 1 2.5.3 3.5 0.008 2.555 0.007 0.022 1 2.5.3 3.5 0.008 2.555 0.001 0.002 1 2.5.3 3.5 0.008 2.555 0.0002 0.002 1 2.5.3 3.5 0.008 2.555 0.0002 0.002 1 2.5.3 3.5 0.008 2.555 0.0002 0.002 1 2.5.3 3.5 0.008 2.555 0.0002 0.002 1 2.5.3 3.5		9500								0.008		
0.0001 0.000 9.7E-07 2.5E+00 25.3 3.5 0.008 2565 Demail of glm3 Skin Surface Area (m²) ABS EF (dayeVr) ED (yrs) BW (kg) AT (daye) Does (gl/kg) 0.01 0.022 1 25.3 3.5 0.008 2555 0.005 0.022 1 25.3 3.5 0.008 2555 0.007 0.022 1 25.3 3.5 0.008 2555 0.007 0.022 1 25.3 3.5 0.008 2555 0.007 0.022 1 25.3 3.5 0.008 2555 0.000 0.022 1 25.3 3.5 0.008 2555 0.000 0.022 1 25.3 3.5 0.008 2555 0.000 0.022 1 25.3 3.5 0.008 2555 0.000 0.022 1 25.3 3.5 0.008 2555		14500								0.008		
Concentration Skin Surface Area (m²) ABS EF (dayeky) ED (yrs) BW (kg) AT (daye) Dose (g/kg)		20000					2.5E+00			0.008		1.16-05
Concentration Skin Surface Area (m²) ABS EF (dayabyr) EO (yrs) BW (kg) AT (days) Dermally Abs Gg/kg Concentration Concen												
Oli Concentration (g/m²) Skin Surface Area (m²) ABS EF (dayekyr) ED (yrs) BW (kg) AT (daye) Dose (g/kg) Co. 0.002 1 25.3 3.5 0.008 2555 0.002 0.002 1 25.3 3.5 0.008 2555 0.000 0.002 1 25.3 3.5 0.008 2555 0.000 0.002 1 25.3 3.5 0.008 2555 0.000 0.002 1 25.3 3.5 0.008 2555 0.000 0.002 1 25.3 3.5 0.008 2555 0.000 0.002 1 25.3 3.5 0.008 2555 0.000 0.002 1 25.3 3.5 0.008 2555 0.000 0.002 1 25.3 3.5 0.008 2555 0.000 0.000 0.002 1 25.3 3.5 0.008 2555 0.000 0.000 0.002 1 25.3 3.5 0.000 2555 0.000 0.00												
Old Concentration (g/m²) Skin Surface Area (m²) ABS EF (dayekyr) ED (yrs) BW (kg) AT (days) Does (g/kg) 0,01 0.022 1 25.3 3.5 0.008 2265 0,005 0.022 1 26.3 3.5 0.008 2565 0,007 0.022 1 26.3 3.5 0.008 2565 0,001 0.002 1 26.3 3.5 0.008 2565 0,001 0.002 1 26.3 3.5 0.008 2565 0,001 0.002 1 26.3 3.5 0.008 2565 0,000 0.002 1 26.3 3.5 0.008 2565 0,000 0.002 1 26.3 3.5 0.008 2565 0,000 0.002 1 26.3 3.5 0.008 2565 0,000 0.002 1 26.3 3.6 0.008 2565 0,000 0.002 <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>												
Oil Concentration (g/m²) Skin Surface Area (m²) ABS EF (dayedyr) ED (yrs) BW (kg) AT (days) Does (g/kg) 0.01 0.022 1 25.3 3.5 0.008 2555 0.005 0.022 1 25.3 3.5 0.008 2555 0.007 0.022 1 25.3 3.5 0.008 2555 0.001 0.002 1 25.3 3.5 0.008 2555 0.001 0.002 1 25.3 3.5 0.008 2555 0.001 0.002 1 25.3 3.5 0.008 2555 0.0005 0.022 1 25.3 3.5 0.008 2555 0.0007 0.0022 1 25.3 3.5 0.008 2555 0.0001 0.0022 1 25.3 3.5 0.008 2555 0.0001 0.0022 1 25.3 3.5 0.008 2555 0.0001 0.0002												
(g/m²) Skin Surface Area (m²) ABS EF (abytay) EU/yrs) ED (yrs) ALI (abyta) AL		Distance	Fog Oil Conc	entration	:			;			3	
0,01 0,022 1 25.3 3.5 0,008 2555 0,005 0,022 1 25.3 3.5 0,008 2555 0,002 0,002 1 25.3 3.5 0,008 2555 0,001 0,002 1 25.3 3.5 0,008 2555 0,0005 0,002 1 25.3 3.5 0,008 2555 0,0002 0,002 1 25.3 3.5 0,008 2555 0,0001 0,002 1 25.3 3.5 0,008 2555 0,0001 0,002 1 25.3 3.5 0,008 2555 0,0001 0,002 1 25.3 3.5 0,008 2555		Ξ	w/6)		Skin Surac	e Area (m ⁻)	ABS	Er (dayayı)	_L	Day (KB)	(days)	4
0,01 0,022 1 25.3 3.5 0,008 2555 0,002 0,022 1 25.3 3.5 0,008 2555 0,002 0,022 1 25.3 3.5 0,008 2555 0,000 0,002 1 25.3 3.5 0,008 2555 0,000 0,002 1 25.3 3.5 0,008 2555 0,000 0,002 1 25.3 3.5 0,008 2555 0,000 0,002 1 25.3 3.5 0,008 2555 0,000 0,002 1 25.3 3.5 0,008 2555 0,000 1 25.3 3.5 0,008 2555 0,000 1 25.3 3.5 0,008 2555 0,000 2 2 2 2 2 0,000 2 2 3.5 0,008 2 0,000 2 2 2	Summer Foraging/Roc	sting Dermal At	psorption									
0.005 0.022 1 26.3 3.5 0.008 2565 0.002 0.022 1 25.3 3.5 0.008 2565 0.001 0.022 1 25.3 3.5 0.008 2565 0.0005 0.022 1 25.3 3.5 0.008 2565 0.0007 0.022 1 25.3 3.5 0.008 2565 0.0001 0.022 1 25.3 3.6 0.008 2565 0.001 0.002 2.002 2.003 2565 0.008 2565		4000			0.0	22		25.3		0.008		
0.002 0.022 1 25.3 3.5 0.008 2555 0.001 0.022 1 25.3 3.5 0.008 2555 0.0005 0.022 1 25.3 3.5 0.008 2555 0.0002 0.022 1 25.3 3.5 0.008 2555 0.0001 0.022 1 25.3 3.5 0.008 2555 0.001 0.002 1 25.3 3.5 0.008 2555		2000		-	0.0	22	•	25.3		0.008		
0.001 0.022 1 25.3 3.5 0.008 2555 0.0005 0.022 1 25.3 3.5 0.008 2555 0.0002 0.022 1 25.3 3.5 0.008 2555 0.0001 0.022 1 25.3 3.5 0.008 2555 0.0001 0.022 1 25.3 3.5 0.008 2555 0.0002 0.001 2.5 2.5 2.5 2.5 2.5		0009			0.0	22		25.3		90.00		
0.0005 0.022 1 25.3 3.5 0.008 2855 0.0002 0.022 1 25.3 3.6 0.008 2855 0.0001 0.022 1 25.3 3.5 0.008 2855 0.0001 0.002 1 25.3 3.5 0.008 2855		7500			0.0	22	•	25.3		90.00		
0.0002 0.022 1 25.3 3.6 0.008 2555 0.0001 0.022 1 25.3 3.5 0.008 2565		9500		5	0.0	22	•	25.3		0.00		
0,0001 0,022 1 26,3 3,6 0,008 2865		14500		2	0.0	22	,	25.3		0.00		
	-	20000			0.0	22	,	25.3		0.00		9.5E-06
								\downarrow				-

Indiana bat intake for fog oil under Pasquill Category B.

	Distance	Fog Oil Concentration								
	(m)	(,w/8)		Intake Rate (m3/day)	(Ae	EF (dava/vr)	FD (vre)			Dally Chronic Intake
Winter Hibernation Inhal	afation		Dally IR	Hourly IR	Event IR		_	BW (Kg)	AT (days)	Value (g/kg-day)
Musgrave Hollow										
Brooks		,,,,,								
Davis #2	12 6624		3.46-04		3.5E-06		17			
Wolf Den			3.45-04	1.4E-05	1.15-05			0.008		2.0E-09
NO.			3.4E-04	1.4E-05	7.2F-06	28.0		0.008	2555	
Rally McConn Holla		0.0005	3.4E-04	1.4E-05	4 25 05			0.00		
MOID IN THE COLUMN					200		4.7	0.008		
Brooks		0.0002	3.45-04	1 45.05						
Davis #2		0.01	3.4F-04	46.05	3.8E-06		4.7	0.008		2000
Wolf Den		0.01	3.4E.04	41.00	1.55-05			0.008	2555	
Joy	X 2004	10.0	10.71		1.0E-05	19.0		000		
Mush Paddle Hollow			0.45-04	1.4E-05	1.2E-05			9000		
Brooks	10335							0.00	2555	5.3E-07
Cavie #2			3.4E-04	1.4E-05	0.0E+00	18				
Wolf Des		0.01	3.4E-04	1.4E-05	1 AF. OR			0.008		0.0E+00
		0.0001	3.4E-04	1.4E-05	7 25 00			0.008		
Reflect Unite	1751	0.01	3.45-04	1 4F.05	0.35.0			0.008	2555	2 65.00
- 6					3.35-00	15.8	4.7	0.008		
BIOOKS		0.0001	3.45-04	1 45.05						
Davis #2	13352	0	3.45.04	4 45 05	3.5E-06	12.7	4.7	0.008		4 07 00
Wolf Den		0.0002	2 45 84	20.3	0.0E+00	12.7	4.7	800.0	2866	80-un
yor		0	200	1.4E-05	7.7E-06	12.7	4.7	9000		0.0E+00
			9.4E-04	1.4E-05	0.0E+00	12.7	1.7	9000		4.5E-09
								0.000	5007	0.0E+00
			1				-		1	.
	Distance	Fog Oil Concentration							1	
	Œ	(g/m²)	Skin Surface Area (m²)	Area (m²)	ABS	ET (desire)				Dermaily Absorbed
Inter Ulbernation					T		ED (MS)	BW (kg)	AT (days)	Dose (a/ka-dav)
Mineral County of the County o	al Absorption									
MOINT MAIN				-						
Brooks	8031	0.0005	0 00							
Davis #2	6524	0.0001	0000		-	26.3	4.7	0.008	2555	0 11 0
Wolf Den	8609	0.0005	0 000	1	-	25.3	4.7	0.008	2555	CO-14:-02
yor	5447	0.0002	2000		-	25.3	4.7	0.00	2655	CO-35.1
Bally McCann Hollow			0.022		-	25.3	4.7	0.00	2556	6.4E-05
Brooks	5803	0.0002								Z.6E-05
Davis #2	2423	0.01	0.022	1	-	19.0	4.7	0.00	28.65	10,
Wolf Den	3861	0.01	0.022		=	19.0	4.7	800 0	2666	35-16
yor	2004	0.01	0.022	1	-	19.0	4.7	0.00	2555	8.0E-04
Mush Paddle Hollow	-		0.022		=	19.0	4.7	8000	SORE	8.0E-04
Brooks	10335	0.0002	- 6	+					2003	8.0E-04
Davis #2	. 2889	0.01	270.0		-	15.8	4.7	0000	2556	
Wolf Den	8432	0.0005	0.022		=	15.8	4.7	8000	2566	1.0E-05
Joy	1751	0.01	0.062		-	15.8	4.7	800 0	2566	8.UE-04
Ballard Hollow	-		0.022		=	15.8	4.7	8000	2000	4.0E-05
Brooks	8449	0.000	0.000	+					0007	8.0E-04
Davis #2	13352	0.0002	0.000	1	-	12.7	4.7	0.00	256.6	
Wolf Den	6829	0.001	0 000		-	12.7	4.7	8000	2666	3.2E-05
Joy	13821	0.0002	0.022	+	=	12.7	4.7	800.0	PERE	1.35-05
			0.022		=	12.7	47	88	2003	6.4E-05

Indiana bat intake for fog oil under Pasquill Category C.

	Distance	Fog Oil Concentration	ntration	į	the Pole (m ⁹)day)	-	FF (davaher)	ED (vm)	BW (kg)	AT (days)	Daily Chronic Intake Value (g/kg-day)
	Ê	(m/6)			ave naie in	1,1	11/22/22/22				
				Dally IR	Hourly IK	EVENT IR					
Summer Foraging/Roosting Inhalation	ting Inhalation			100	30	30 23 6		3.5	800.0		1.5E-06
	3000			3.47.04	1.40	3,55.05		3.5	8000		7.6E-07
	3000		1	3.45-04	46.06	3.55-05		35	9000		3.0E-07
	3000			3.40	14 AB OF	3.55.05	26.3	3.5	0.008	2555	1.5E-07
	0004		1.	3.40-04	20 19	2 55 08		3.5	0000		7.6E-08
	6500			3.4E-04	1.4E-03	3.35-03		2 6	800.0		3 0E-08
	9500	0.0002	2	3.4E-04	1.4E-C3	3.35-00		200	800		80 35 v
	14000	0.0001	_	3.4E-04	1.4E-05	3.5E-05		3.0	0.008		00-00
								1			
		10 893									
	Distance	Deposition	Prey SA	Prey Weight		Intake Rate				;	Dally Chronic Intake
	Ξ	(g/m²)	(a)	6	CF (9/9)	(g/day)	EF (dayslyr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
						Daily IR					
Summer Foragina/Boosting Ingestion	ating Innestion										
San San San San San San San San San San	3000		0.0000	0.0	9.7E-05	2.5E+00		3.5	0.008		
	4000		00000			2.5E+00		3.5	0.008		
	0000	0 00	00000	000		2.5E+00	25.3		0.008	2555	
	950		0000			2.5E+00			0.008		
	300			000		2.5E+00			900.0		
	24000				Ì				0.008		
	00007				9.7E-07	2.5E+00			0.008	2555	1.1E-05
	200										
											Dermatty Absorbed
	Distance	Fog Oil Concentration (a/m²)	entration ',	Skin Surface Area (m²)	e Area (m²)	ABS	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Dose (g/kg-day)
Summer Foraging/Roosting Dermal Absorption	sting Dermai At	sorption									
	3000	0.01		0.022	22		1 25.3		0.008	2555	
	4000		5	0.0	22	1	1 25.3				
	2000	0.002	2	0.0	22		1 25.3				
	8500		1	0.022	22		1 25.3	3.5		2555	
	12000		15	0.0	22		1 25.3				
	24000		12	0.0	22	,-	1 25.3			1 2555	
	4000		=	0.0	22	Ĺ	1 25.3		0.008		9.5E-06
											-

Indiana bat intake for fog oil under Pasquill Category C.

	Ē	(m/e)	•							
	L		_,	Intake Rate (m"/day)	ay)	EF (dayslyr)	ED (vrs)	AW Chai		<u> </u>
Winter Hibernation Inhal	alation		Daily IR	Hourly IR	Event IR		1_	(Au)	(aga)	Value (g/kg-day)
Musgrave Hollow	-									
Brooks		0000								
Davis #2	2 6624	0.000	3.4E-04	1.4E-05	3.5E-06		17	100		
Wolf Den		0.0002	3.4E-04	1.4E-05	1.1E-05			90.0	2555	
100		0.0002	3.4E-04	1.4E-05	7.2E-06	28.3		0.00	1	
Raily McCann Lotter		0.0005	3.4E-04	1.4E-05	1 25 05			0.008		8 3F-09
Broth					20.37		4.7	0.008	2555	
SOLO C		0.0005	3.4E-04	1 4E.05	00 40 6					
Davis #2	2423	0.01	3.4F-04	1 46 96	3.05-00		4.7	0.008	2555	00 25 0
Wolf Den		0.001	3.45.04	2014	1.35-05		4.7	00.0		
yor	7 2004	004	5 2	CD-14-	1.0E-05	19.0	4.7	200		
Mush Paddle Hollow			3.45-04	1.4E-05	1.2E-05		1.7	300		4.5E-08
Brooks	10335	,000						200	2555	5.35-07
Cavis #2	L	1000.0	3.4E-04	1.4E-05	0.0E+00	48.8	1			
THE STATE OF THE S		0.01	3.4E-04	1.4E-05	1 45.05		4.7	0.008		0.0E+00
A A COL		0.0002	3.4E-04	1.48.05	2010		4.7	0.008	2555	5 6F.07
yor	1751	0.01	3.4E-04	4 4 5 0 5	0.25-00		4.7	0.008		A 25 00
- 1				2	9.3E-06	15.8	4.7	0.008		2 17 6
Brooks		0.0002	3.4E.04	, 45 00						0.450
Davis #2		0.0001	246.04	00-24-1	3.5E-06	12.7	4.7	0.008		
Wolf Den	6859	0.0002	100	CO-34	0.0E+00	12.7	4.7	800 0	2000	Z.UE-09
yor	13821	0 0001	0.45-04	1.4E-05	7.7E-06	12.7	4.7	9000		0.0E+00
			3.45-04	1.4E-05	0.0E+00	12.7	15	8	0007	4.5E-09
								2.008		0.0E+00
	Distance	Fog Oil Concentration		-						
	Œ	(g/m²)	Skin Surface Area (m²)	Area (m²)	ABS	En (despetie)			-	Dermally Absorbed
Winter Libernation C				-	T	1	EU (yrs)	BW (kg)	AT (days)	Dose (g/kg-day)
Wiscomic Vella	al Absorption			-						
Sales rollow										
Brooks		0.001	0000							
Davis #2	6624	0.001	2000			25.3	4.7	0.008	2555	
Wolf Den	8609	0 0005	0.022		+	25.3	4.7	800	2000	1.35-04
Joy	5447	1000	0.022		-	25.3	47	200	0007	1.3E-04
Baily McCann Hollow		1000	0.022		-	25.3	1.7	800	6007	6.4E-05
Brooks	5803	500.0	-					0.003	2555	1.3E-04
Davis #2	2423	100.0	0.022		-	19.0	4.7	0000		
Wolf Den	3864	10.0	0.022		-	400		90.0	2555	9.6E-05
70	1000	0.005	0.022	-	-	200		0.008	2555	9.6E-04
Mush Paddle Hollow	2004	0.01	0.022		-	0.00	4.7	0.008	2555	4.8E-04
TO TO TO TO TO TO TO TO TO TO TO TO TO T			-		+	18.0	4.7	0.008	2555	9 6F-04
Brooks	10335	0.0005	0.022		-					
Male Dec	2889	0.01	0.022	-		9.0	4.7	0.008	2555	4.0E-05
TO TOA	8432	0.001	0.022		- -	200	4.7	0.008	2555	8 OF-04
you	1751	0.01	0.022			8.0	4.7	0.008	2555	R OF OS
WOND THE				-	-	10.8	4.7	0.008	2555	8.0E-04
Dayle #5	8449	0.001	0.022				1			
10/016 Day	13352	0.0002	0.022		+	12.1	4.7	0.008	2555	6.4E-05
Avoit Den	6829	0.001	0.022		- -	1771	4.7	0.008	2555	1.35.05
you	13821	0.0002	0.022	-		12.7	4.7	0.008	2555	6.48.05
						12.7	4.7	0.008	JAKE	7,7,7

Indiana bat intake for fog oil under Pasquill Category D.

Distance (m) Summer Foraging/Roosting Inhalation 2500 3000 3000 6000 6000 9500	Distance (m)							-			Partie Change Induly
Summer Foraging/Roosting In	Ξ	Fog Oil Concentration	ntration		•						Daily Chronic Intake
Summer Foraging/Roosting In		(a/m²)		Int	Intake Rate (m³/day)	lay)	EF (dayslyr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
Summer Foraging/Roosting In				Dally IR	Hourly IR	Event IR					
	halation										
	2500	0.01		3.4E-04	1.4E-05	3.5E-05		3.5	0.008		
	3000	0.005		3.4E-04	1.4E-05			3.5	0.008		
	4500	0.002		3.4E-04	1.4E-05			3.5	0.008		
	0009	000		3.4E-04	1.4E-05			3.5	0.008		
	205	0 0000		3.4E-04	1.4E-05			3.5	0.008		
	16500	0.0002		3.46-04	1.4E-05	3.5E-05	25.3	3.5	0.008	2555	3.0E-08
	26500	0.0001		3.4E-04	1.46-05			3.5	0.008		1.5E-08
10	Distance	Deposition	Prey SA	Prey Weight		Intake Rate					Daily Chronic Intake
	E	(g/m²)	Œ	(6)	CF (g/g)	(a/day)	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
						Dally IR					
Summer Foraging/Roosting Ingestion	gestion										
	6500	0.0	0.000	0.00	9.7E-05	2.5E+00			0.008		
	8500	0.005	0.0000	00.0	4.9E-05			3.5	0.008		
	14500	0.002	0.000		1.9E-05		25.3		0.008	2555	
	22000	0.001	00000	0.00	9.7E-06				0.008		
	35500	0.0005	0.0000		4.9E-06			3.5	0.008		
	\$0000÷	0.0002	0.0000		1.9E-06				0.008		
	\$0000¢	0.0001	00000		9.7E-07	2.5E+00		·	0.008		1.1E-05
	1										
ā	stance	Fog Oil Concentration	ntration		•						Dermally Absorbed
	Œ	(g/m²)		Skin Surface Area (m²)	Area (m²)	ABS	EF (deyelyr)	ED (yrs)	BW (kg)	AT (days)	Dose (g/kg-day)
Summar Ecratine (Boostine Demai Absorbine	armsi Ahe	orntina									
A STATE OF THE STA	6500	0.00		0 025	22		25.3	3.5	0.008		9.5E-04
	8500			0.0	22		25.3		0.008	2555	4.8E-04
	14500			0.022	22		25.3		0.008		
	22000			0.022	22		25.3		0.008		9.5E-05
	35500			0.022	22		25.3		0.008		
	\$0000¢	0.0002		0.022	22		25.3	3.5	0.008		
	50000++		_	0.022	22		25.3		0.008		9.5E-06

Indiana bat intake for fog oil under Pasquill Category D.

346-04 146-05 1,60-05 255.3 4.7 0.008 2555 346-04 1,46-05 1,16-05 255.3 4.7 0.008 2555 346-04 1,46-05 1,16-05 255.3 4.7 0.008 2555 346-04 1,46-05 1,26-05 1,26-05 15.0 4.7 0.008 2555 346-04 1,46-05 1,26-05		Distance (m)	Fog Oil Concentration (g/m²)		e dans de de de de de de de de de de de de de						Osily Chambella Late
Marchi Inhibition Marc					Of MI ale (M)	ay)	EF (days/yr)	_	BW (kg)	AT (dave)	Walte (after the
Decided Color Co	Winter Hibernation inha			Daily IK	Hourly IR	Event IR					Value (g/kg-day)
Heat	Musgrave Hollow										
Mainting	Brooks		0 000								
Well Date 6869 Control Contr	Davis #2		0,000	3.4E-04		3.5E-06			186		
March Marc	Wolf Den		50000	3.4E-04		1.15-05		L	3 3		
Property Color C	vol.		0.000	3.4E-04		7.2E-06			0.00		
Decision Section Control Con	Rally McCann Lotter		0.001	3.4E-04	1.4E-05	1 2E.06			0.00		
Decide Section Control Section Control Control Section Control Contr	WCCAINI TONO					20.			0.00		
Worl Den 432 0.01 3.45-04 1.85-04 180 4.7 0.00 2555 Volumer 2 3.85-04 0.02 3.45-04 1.45-05 1.85-05 180 4.7 0.000 2255 Profess 2.00 0.000 3.45-04 1.45-05 1.85-05 1.80 4.7 0.000 2255 Profess 2.00 0.000 3.45-04 1.45-05 1.85-05 1.5 0.00 2255 Profess 2.00 0.000 3.45-04 1.45-05 1.25-05 1.5 0.00 2.25 Profess 0.000 3.45-04 1.45-05 0.35-06 1.2 0.00 2.25 Vivol Dan 4.47 0.000 3.45-04 1.45-05 0.35-06 1.2 0.00 2.25 Vivol Dan 4.47 0.000 3.45-04 1.45-05 0.005-00 1.2 0.000 2.25 0.000 Dank Dank 4.47 0.000 3.45-04 1.45-05 0.000-00	Brooks		0.001	3.4E-04	1 4E.05	207.00					
Main Main	Davis #2		0.01	3.45.04	200	3.62-06		4.7	0.00		
Parcel P	Wolf Den		0.002	2 47 6	00.3	1.5E-05		4.7	000		
Process 1352	yor		001	3.45-04	1.4E-05	1.0E-05	19.0	4.7	200		
Bicosis 10335 0,0002 3.4E-04 1.4E-05 0.0EE-00 15.8 4.7 0.000 2265 1.4E-04 1.4E-05 0.0EE-00 12.2 4.7 0.000 2265 1.4E-04 1.4E-05 0.0EE-00 12.2 4.7 0.000 2265 1.4E-04 1.4E-05 0.0EE-00 12.2 4.7 0.000 2265 1.4E-04 1.4E-05 0.0EE-00 12.2 4.7 0.000 2265 1.4E-04 1.4E-05 0.0EE-00 12.2 4.7 0.000 2265 1.4E-04 1.4E-05 0.0EE-00 12.2 4.7 0.000 2265 1.4E-04 1.4E-05 0.0EE-00 12.2 4.7 0.000 2265 1.4E-04 1.4E-05 0.0EE-00 12.2 4.7 0.000 2265 1.4E-04 1.4E-05 0.0EE-00 12.2 4.7 0.000 2265 1.4E-04 1.4E-05 0.0EE-00 12.2 4.7 0.000 2265 1.4E-04 1.4E-05 0.0EE-00 12.2 4.7 0.000 2265 1.4E-04 1.4E-05 0.0EE-00 12.2 4.7 0.000 2265 1.4E-04 1.4E-05 0.0EE-00 1.2 4.7 0.000 2265 1.4E-04 1.4E-05 0.0EE-00 1.2 4.7 0.000 2265 1.4E-04 1.4E-05 0.0EE-00 1.2 4.7 0.000 2265 1.4E-04 1.4E-05 0.0EE-00 1.2 4.7 0.000 2265 1.4E-04 1.4E-05 0.0EE-00 1.2 4.7 0.000 2265 1.4E-04 1.4E-05 0.0EE-00 1.2 1.4E-04 1.4E-0	fush Paddle Hollow		0.0	3.4E-04	1.4E-05	1.2E-05	0.61	1	0.00		
Division Comparison Compa	Brooke						2	1	0.008		5.3E-0
Noti Chee 6445 0.000 3.4E-04 1.4E-05 1.5E-05 1.5E 05 1.5E-05	Ch alved		0.0002	3.4E-04	1.4E-05	0.0F+00	9				
March Marc	Davis #2		0.01	3.45-04	1.4E-05	4 85 06	0.0	4.7	0.008		0+30.0
Marco 1731 1732 1733	Noil Den		0.0005	3.4E-04	1 45.05	1.05-03	9.0	4.7	0.008		AREA
Brooks 6449 0.0005 3.4E-04 1.4E-05 3.3E-04 1.2E-05		1751	0.01	3.45.04	200	90-17	15.8	4.7	0.008		200
Decision Section Sec	- 1				1.45-00	9.3E-06	15.8	4.7	0.008		0-36-1
Davie at 2 13322	Brooks		0.0005	3,45,01							0-25 c
Worl Den 6859 0.0003 3.4E-04 1.4E-05 0.0E+00 12.7 4.7 0.008 2555 Joy 13321 0.0002 3.4E-04 1.4E-05 0.0E+00 12.7 4.7 0.008 2555 Image: Companied and companied and companied attention atte	Davis #2	13352	0000	9.45-04	1.4E-05	3.5E-06	12.7	4.7	8000		
Distance	Wolf Den	6859	20000	3.45-04	1.4E-05	0.0E+00	12.7	1.7	0000		5.1E-0
Design	20	43834	0.000	3.4E-04	1.4E-05	7.7E-06	12.7	1	90.0		0.0E+0
Distance Fog Oil Concentration Demands		700	0.0002	3.4E-04	1.4E-05	0.05+00	5		0.008		1.15.0
Distance Fog OII Concentration Concentra		+			-			•	0.008		0.0E+0
Dietance Fag Oil Concentration Skin Surface Area (m²) ABS EF (day-ubyr) ED (yra) BW (kg) AT (day-ubyr) Does (g/kg) AT (day-ubyr) AT (day-ubyr) Does (g/kg) AT (day-ubyr) Does (g/kg) AT (day-ubyr) AT (day-ubyr) AT (day-ubyr) AT (day-ubyr) Does (g/kg) AT (day-ubyr) AT (day-ubyr) AT (day-ubyr) Does (g/kg) AT (day-ubyr) AT (day-u											
Distance Fog Oil Concentration Skin Surface Area (mt) ABS EF (dayu)yr) ED (yrs) BW (kg) AT (dayu) Description		1					1				
Character Color Contentration Color Contentration Color		1						1			
(m) (g/m²) Skin Surface Area (m²) ABS EF (dayulyr) ED (yrs) BW (kg) AT (dayu) Done glik Done g		Distance	Fod Oil Concentration								
Secondary Seco		Ê	(g/m²)	Skin Surface	Area (m²)		F (davaher)	ED (var)			Dermaily Absorbed
low Brooks 8031 0.005 0.022 1 25.3 4.7 0.006 2565 Parks 6624 0.002 0.022 1 25.3 4.7 0.006 2565 Worl Dan 8609 0.002 0.022 1 25.3 4.7 0.006 2565 Hollow 5447 0.01 0.022 1 25.3 4.7 0.006 2565 Hollow 5447 0.01 0.022 1 25.3 4.7 0.006 2565 Brooks 5463 0.01 0.022 1 19.0 4.7 0.006 2556 Worl Dan 3861 0.01 0.022 1 19.0 4.7 0.006 2556 Worl Dan 3861 0.01 0.022 1 19.0 4.7 0.006 2556 Worl Dan 3861 0.01 0.022 1 19.0 4.7 0.006 2556 Brooks 4022	nter Hibernation Derma								DAY (Kg)	AT (days)	Dose (g/kg-day)
Brooks 8031 0,005 0,022 1 25.3 4.7 0,006 2555	Agrave Hollow				_			1			
Davie No. Control Co							1				
Molf Deri 6624 0.005 0.022 1 25.3 4.7 0.006 2565 Wolf Deri 6609 0.002 0.022 1 26.3 4.7 0.008 2565 Hollow 5447 0.01 0.022 1 26.3 4.7 0.008 2565 Brooks 5803 0.01 0.022 1 26.3 4.7 0.008 2565 Brooks 5803 0.01 0.022 1 18.0 4.7 0.008 2565 VolI Den 3861 0.01 0.022 1 18.0 4.7 0.008 2565 VolI Den 3861 0.01 0.022 1 18.0 4.7 0.008 2565 Pavis #2 2289 0.01 0.022 1 18.0 4.7 0.008 2565 Vol Den 432 0.002 0.022 1 15.8 4.7 0.008 2565 Joy 417 0.004	DIOOKS	8031	0.005	0.022							
Worl Dail 8669 0.002 0.022 1 25.3 4.7 0.008 2556 Hollow Joy 5447 0.01 0.022 1 25.3 4.7 0.008 2556 Hollow Binoks 5803 0.01 0.022 1 26.3 4.7 0.008 2556 Davis #2 2423 0.01 0.022 1 18.0 4.7 0.008 2556 Worl Dan 3861 0.01 0.022 1 18.0 4.7 0.008 2565 Worl Dan 3861 0.01 0.022 1 18.0 4.7 0.008 2565 Hollow 0.01 0.022 1 18.0 4.7 0.008 2565 Davis #2 2.2889 0.01 0.022 1 16.8 4.7 0.008 2565 Vol Davis #2 1.531 0.005 0.022 1 1.58 4.7 0.008 2565 Bavis #2 0.005 0.005	Z# SIARC	6624	0.005	0.022		†	20.3	4.7	0.008	2555	6.4F.04
Joy 5447 0.01 0.022 1 25.3 4.7 0.008 2856 Brooks R2 5803 0.01 0.022 1 19.0 4.7 0.008 2856 Davis R2 2433 0.01 0.022 1 19.0 4.7 0.008 2856 Voli Den 3861 0.01 0.022 1 18.0 4.7 0.008 2856 Voli Den 3861 0.01 0.022 1 18.0 4.7 0.008 2856 Voli Den 0.01 0.022 1 18.0 4.7 0.008 2856 Davis #2 2889 0.01 0.022 1 15.8 4.7 0.008 2856 Vol Den 432 0.005 0.022 1 15.8 4.7 0.008 2565 Joy 1751 0.005 0.022 1 15.8 4.7 0.008 2565 Bacoks 0.005 0.002 0.022	Worl Den	8609	0.002	0 0	-	+	25.3	4.7	0.008	2555	A AE-DA
Hollow H	Joy	5447	0.01	0.00		7	25.3	4.7	9000	2555	200
Brooks 5603 0.01 0.022 19.0 4.7 0.00 2565 Volf Dan 3861 0.01 0.022 1 19.0 4.7 0.00 2565 Volf Dan 3861 0.01 0.022 1 19.0 4.7 0.00 2565 Volf Dan 2004 0.01 0.022 1 18.0 4.7 0.00 2565 Brooks 1.0335 0.002 0.022 1 16.8 4.7 0.00 2565 Volf Dan 4.32 0.002 0.022 1 15.8 4.7 0.008 2565 Joy 1751 0.005 0.022 1 15.8 4.7 0.008 2565 Brooks 2432 0.005 0.022 1 15.8 4.7 0.008 2565 Brooks 0.01 0.022 1 15.8 4.7 0.008 2565 Brooks 0.002 0.022 1 1.2	ly McCann Hollow	-		0.022		=	25.3	4.7	0.00	2555	4.00-04
Davis #2 2423 0.01 0.022 1 18.0 4.7 0.008 2555 Wolf Dan 3861 0.01 0.022 1 18.0 4.7 0.006 2855 Hollow- Iotics 2004 0.01 0.022 1 18.0 4.7 0.008 2855 Brooks 10335 0.002 0.012 0.022 1 18.0 4.7 0.008 2855 Davis #2 2889 0.01 0.022 1 15.8 4.7 0.008 2855 Voll Den 8432 0.005 0.022 1 15.8 4.7 0.008 2855 Books 15.1 15.8 4.7 0.008 2855 2855 Books 0.01 0.022 1 15.8 4.7 0.008 2855 Books 0.022 0.022 1 15.8 4.7 0.008 2855 Books 0.002 0.022 1 12.7 4.7 <td>Brooks</td> <td>5803</td> <td>100</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>2</td> <td>1.35-03</td>	Brooks	5803	100							2	1.35-03
Volt Den 3861 0.01 0.022 1 18.0 4.7 0.00 2555 Joy 2004 0.01 0.022 1 18.0 4.7 0.006 2865 Blooks 10335 0.002 0.022 1 15.6 4.7 0.006 2865 Wolf Den 8432 0.005 0.022 1 15.8 4.7 0.006 2865 Wolf Den 8432 0.005 0.022 1 15.8 4.7 0.008 2865 Wolf Den 8432 0.005 0.022 1 15.8 4.7 0.008 2865 Brooks 1751 0.005 0.022 1 15.8 4.7 0.008 2865 Brooks 13352 0.005 0.002 1 15.8 4.7 0.008 2865 Joy 13352 0.005 0.002 1 12.7 4.7 0.008 2865 Joy 0.005 0.002	Davis #2	2423	001	0.022		-	19.0	4.7	800.0	25.66	
Joy 2004 0.022 1 19.0 4.7 0.006 2555 Hooks 10335 0.002 0.022 1 18.0 4.7 0.008 2565 Davis #2 2889 0.01 0.022 1 15.8 4.7 0.008 2565 Wolf Den 28432 0.005 0.022 1 15.8 4.7 0.008 2565 Wolf Den 1643 0.01 0.022 1 15.8 4.7 0.008 2565 Brooks 2843 0.005 0.022 1 15.8 4.7 0.008 2565 Brooks 2843 0.005 0.022 1 15.8 4.7 0.008 2565 Avid Den 6859 0.005 0.022 1 12.7 4.7 0.008 2565 Avid Den 6859 0.005 0.022 1 12.7 4.7 0.008 2565 Joy 1.27 4.7 0.008	Wolf Den	3861	100	0.022		-	19.0	4.7	000	3	9.6E-04
Parish P	vol	7000	100	0.022		-	0.01		900	0007	9 6E-04
Brooks #10335	Sh Paddle Hollow	5007	0.01	0.022		-	40.0		0.00	2555	9.6E-04
Davis #2 10330 0,002 0,002 1 15.8 4.7 0,008 2555 Voli Den 432 0,005 0,022 1 15.8 4.7 0,008 2555 Voli Den 432 0,005 0,022 1 15.8 4.7 0,008 2555 Brooks 8449 0,005 0,002 1 15.8 4.7 0,008 2555 Noll Den 6859 0,002 0,002 1 12.7 4.7 0,008 2555 Aly 13821 0,005 0,002 0,002 1 12.7 4.7 0,008 2555 Joy 13821 0,002 0,002 1 12.7 4.7 0,008 2555	Brooke	10000					200	•	0.00	2555	9.6E-04
Worl Den £432 0.01 0.022 1 15.8 4.7 0.008 255.8 Worl Den £432 0.005 0.022 1 15.8 4.7 0.008 255.8 Broks 1751 0.01 0.022 1 15.8 4.7 0.008 255.8 Broks 6449 0.005 0.022 1 15.8 4.7 0.008 255.8 Nolf Den 6859 0.002 0.022 1 12.7 4.7 0.008 255.5 Joy 13821 0.002 0.022 1 12.7 4.7 0.008 255.5 Joy 13821 0.002 0.002 0.002 1 12.7 4.7 0.008 255.5	Care diago	0330	0.002	0.022		-	9,				
Wolf Den 8432 0.005 0.005 0.022 15.8 4.7 0.008 2565 Joy 1751 0.01 0.022 1 15.8 4.7 0.008 2565 Brooks 8449 0.005 0.022 1 15.8 4.7 0.008 2565 Nolf Den 6859 0.002 0.022 1 12.7 4.7 0.008 2565 Nolf Den 6859 0.006 0.022 1 12.7 4.7 0.008 2565 Joy 1327 4.7 0.006 2565	Cavis #2	2889	0.01	0.022		 	0.0	7.4	0.008	2555	1.6E-04
Marcolist 15.5 0.001 0.002 1 15.5 4.7 0.008 2.555 1 15.5 4.7 0.008 2.555 1 15.5 1.0 0.008 2.555 1 1 1.2 1.0 0.008 2.555 1 1.2	Wolf Den	8432	0.005	0.022		+	15.8	4.7	0.008	2555	8.0F-04
Brooks 6449 0.005 0.022 1 12.7 4.7 0.008 2856 Pavis #2 13352 0.002 0.022 1 12.7 4.7 0.008 2856 Voli Den 8859 0.005 0.022 1 12.7 4.7 0.006 2856 Joy 13821 0.002 0.022 1 12.7 4.7 0.006 2855		1751	0.01	0.000			15.8	4.7	0.008	2555	70507
6449 0.005 0.022 1 12.7 4.7 0.008 2565 13352 0.002 0.022 1 12.7 4.7 0.008 2565 6859 0.006 0.002 1 12.7 4.7 0.006 2565 13821 0.002 0.022 1 12.7 4.7 0.006 2565	- 1			-		-	15.8	4.7	0.008	25.55	10.4
13352 0.002 0.022 1 12.7 4.7 0.008 2555 8659 0.005 0.022 1 12.7 4.7 0.008 2556 13821 0.002 0.022 1 12.7 4.7 0.008 2556 13821 0.002 0.022 1 12.7 4.7 0.008 2556	Brooks	8449	0 005	- 000	1			_			9.UE-04
6859 0.005 0.022 1 12.7 4.7 0.008 2555 13621 0.002 0.022 1 12.7 4.7 0.008 2555	Davis #2	13352	0 000	0.022		=	12.7	4.7	8000	256.6	
13821 0.002 0.022 1 12.7 4.7 0.008 2555	Wolf Den	6859	2000	0.022		F	12.7	4.7	8000	2007	3.2E-04
0.022 0.006 2355	vol.	13824	500.5	0.022		1	12.7	1.7	980	5000	1.3E-04
		13051	0.002	0.022		-	42.7		90.0	2555	3.2E-04

Indiana bat intake for fog oil under Pasquill Category E.

		2000	notherna		•						Onthe Change Labor.
	Distance (m)	rog Oil Concentration (g/m³)	entration)	tut	intake Rate (m³/day)	(ay)	EF (days/yr)	ED (yrs)	BW (kg)	AT (daye)	Daily Chronic Intake Value (g/kg-day)
				Dally IR	Hourly IR	Event IR					
Summer Foraging/Roosting Inhalation	sting inhalation										
	3000	10.0		3.4E-04	1.4E-05	3.5E-05		3.5	0.008		1.55-06
	4000			3.4E-04	1.4E-05	3.55-05		3.5	0.008		7.6E-07
	7000			3.4E-04	1.4E-05	3.5E-05		3.5	0.008		3.0E-07
	10000			3.4E-04	1.4E-05	3.5E-05	25.3	3.5	0.008	2555	1.5E-07
	16000		2	3.4E-04	1.4E-05	3.5E-05		3.5	0.008		7.6E-08
	30000	0.0002	~	3.4E-04		3.5E-05		3.5	0.008		3.0E-08
	20000		1	3.4E-04	1.4E-05			3.5	0.008		1.5E-08
		Feg Oil									
	Dietance	Deposition (a/m²)	Prey SA	Prey Weight	CF (a/a)	intake Rate (o/day)	EF (davahr)	ED (vrs)	BW (kg)	AT (dave)	Dally Chronic Intake Value (o/ko-dav)
						Daily IR					
Summer Foraging/Roosting Ingestion	sting Ingestion										
	7500	0.01	0.000	0.00	9.7E-05	2.5E+00	25.3	3.5	0.008		1.1E-03
	10000	0.005	0.0000	00.00	4.9E-05	2.5E+00	25.3	3.5	0.008	2555	5.3E-04
	18000	0.002	0.000	0.00	1.9E-05	2.5E+00		3.5	0.008		
	30000	0.001	0.000	00:00	9.7E-06	2.5E+00		3.5	0.008		1.1E-04
	20000	0.0005	0.0000	0.00	4.9E-06		25.3	3.5	0.008		\$.3E-05
	\$0000+		0.0000	0.00	1.95-06	2.5E+00		3.5	0.008	2555	2.1E-0
	++0000\$	100001	0.0000	00:00	9.7E-07	2.5E+00		3.5	0.008		1.1E-05
	2000	For Oll Concentration	entration					-			betroath vilemad
	(E)	(g/m²)	,	Skin Surface Area (m²)	e Area (m²)	ABS	EF (dayslyr)	ED (yrs)	BW (kg)	AT (days)	Dose (g/kg-day)
Summer Foracion/Boosting Dermal Absorption	eting Dermal Ab	continu									
0	7500	0.0		0.022	2	-	25.3	3.6	0.008	2555	9.5E-04
	10000			0.0	22	-	25.3	3.5	0.00		4.8E-04
	18000			0.022	22	-	25.3	3.5	0.008		1.9E-04
	30000			0.0	22	•	25.3	3.5	0.008		
	20000	0.0005	5	0.022	22	1	25.3	3.5	0.008		
	+00009		2	0.0	22	+	25.3	3.6	0.008		
	\$0000++		-	0.0	22	-	26.3	3.6	0.008		9.5E-06

Indiana bat intake for fog oil under Pasquill Category E.

	Distance (m)	Fog Oil Concentration (g/m³)								
				intake Rate (m"/day)	(À	EF (davahr)	ED Ame			Dally Chronic Intake
Winter Hibernation inhal	halation		Dally IR	Hourly IR	Event IR		L	BW (kg)	AT (days)	_
Musgrave Hollow										
Brooks	ks 8031	1000								
Davis #2			3.4E-04		3.55-06					
Wolf Den	en 8609		3.4E-04	1.4E-05	1 1E.05	200		0.008	2555	2000
YOP	_		3.4E-04	1.4E-05	7.2E.0a			0.00		
Bally McCann Hollow		0.002	3.4E-04	1 45.05	2010		4.7	0.00		
	1			3	1.ZE-05			9000		4.2E-08
Brooks		0.002	2 45 04					000		1.4E-07
Davis #2	أست		200	1.4E-05	3.85-06	40.0				
Wolf Den	3861		3.4E-04	1.4E-05	1.5F.05			0.008	2555	3 25 00
NG.			3.46-04	1.4F.05			4.7	0.008		
Much Padote Letter		0.01	3.4F.04	1 10 00	CO-10.	19.0	4.7	0000		6.7E-07
MOIIOL BIRD				Ch-12-13	1.2E-05	19.0	1.4	8		2.3E-07
Brooks	10335	0 0005					•	0.008	2555	5.3F.07
Davis #2			3.4E-04	1.4E-05	OPHO	1				
Wolf Den	0000		3.4E-04	1.45.05	20 30	13.8	4.7	0.008	2555	
		0.0001	3.45-04	4 45 06	20-20-	15.8	4.7	800.0		0.UE+00
Ballard Unit	1751	0.01	2 46 04	S .	7.2E-06	15.8	4.7	2000	0007	5.6E-07
- 1				2.4	9.3E-06	15.8		0.000		2.6E-09
Brooks	8449	100.0						0.008	2555	3 4F-07
Davis #2			3.4E-04	1.4E-05	3.55.08	100				
Wolf Den			3.4E-04	1.4E-05	200	77	1.4	0.008		
٩		0.002	3.4E-04	4 AF 06	3	12.7	4.7	800 0		-0E-08
100	13821	0.0005	3 4F-04	20.0	/./E-06	12.7	4.7	800	2007	0.0E+00
			1	45-05	0.0E+00	12.7	;	0000	1	4.5E-08
					-			0.008	2555	0.0F+00
							+			
							+	1		
	Distance	Fog Oil Concentration					1			
	Ē	(g/m²)	Skin Confess	•		_				
	_		(III)	(W)	ABS	EF (davatur)	ED (ver)	_	_	Dermally Absorbed
vvinter Hibernation Dermal A	al Absorption		1		-	L		OW (Kg)	AT (days)	Dose (g/kg-dav)
Musgrave Hollow						1	1			
Brooks	8034					1			-	
Ca alve d		0.005	0,022		+					
Mak		0.01	0 00		=	25.3	4.7	800	7000	
LO IOLA		900'0	688			26.3	4.7	900	2007	6.4E-04
λος .	5447	0.01	7700		=	26.3	1.	9	2555	.1.3€-03
Bally McCann Hollow			0.022		-	28.2		0.008	2555	6.4E-04
Brooks	5803	100	1			+	•	0.008	2555	1 35.03
Davis #2	2423	10.5	0.022		+	100			_	
Wolf Den	3864	0.0	0.022	_	-	200	4.7	900.0	2555	200
3	1000	0.01	0.022		1	19.0	4.7	0.008	2555	9.0E-04
Mush Paddle Hollow	2007	0.01	0,022		-	19.0	4.7	0.008	25.66	3.0E-04
			-	-		19.0	4.7	800	3	9.6E-04
DIOOKS	10335	0.002	5					900	0007	9.6E-04
Davis #2	2889	0.01	270.0		-	15.8	1			
Wolf Den	8432	0.005	0.022		-	15.8		6.008	2555	1.6E-04
Joy	1751	200	0.022		-	9,4		0.008	2555	8.0E-04
Ballard Hollow			0.022		-	2 3		0.008	2555	A DE DA
Brooks	9770					9.0	4.7	0.008	2555	1000
Davle #2	2000	0.005	0.022		1					9.UE-04
A STATE OF THE OWNER OWNER OW	13332	0.002	0 002	-		12.7	4.7	8000	2550	
100	6829	0.005	200			12.7	4.7	800 0	2000	3.2E-04
l dor	13821	0.002	0000	1	-	12.7	4.7	9000	5333	1.3E-04
					=	12.7	4.7	2000	0007	3.2E-04
							-	(MI II)		

Attachment C: Terephthalic Acid (TPA) Grenades

Indiana bat intake for TPA under Pasquill Category B.

9	902					Ħ				Daily Chronic Intake
		TPA Concentration (g/m3)	트	ntake Rate (m³/day)	ay)	(eventlyr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
	Γ		Daily IR	Hourly IR	Event IR					
Summer Foracing/Roosting Inhalation	alation									20 20 0
	2002	6	3.4E-04	1.4E-05	5.9E-07	3136	3.5	0.008		
	3 5	5000	3.4E-04	1.4E-05	5.9E-07	3136	3.5	0.008		
	3 5	200.0	3.4E-04		5.9E-07	3136	3.5	0.008	2555	
	3 5	0.002	2 AE DA	1 4F.05	5 9F-07	3136	3.5	0.008		
	8	0.001	3.45-04	40.04	5 OF 07	3136	3.5	000		1.6E-07
	2000	0.000.0	3.4E-04	1	0.30.0	3436	25	0000		6.3E-08
	2000	0.0002	3.4E-04).9E-0/	0010	200	0000		
	0009	0.0001	3.4E-04	1.4E-05	5.9E-07	3130	3.5	0.00		
	1									
						Ü				Daily Chronic Intake
Dist	Distance	TDA Concentration (g/m3)	=	Intake Rate (m³/day)	(day)	(eventlyr)	ED (yrs)	BW (kg)	AT (days)	
	T		Dally IR	Hourly IR	Event IR					
	1									
Winter Hiberation Innaiation	18		AC DA	1 4F-05	5.9E-07	3136	4.7	0.008	8 2555	
	300	1000	2 46 04			3136	4.7	0.008		5 2.1E-06
	3	0.003	2 46 5				4.7	0.008	8 2555	
	3	0.002	70 17 0				4.7	0.008		5 4.3E-07
	4000	0.00	טיידר כ							5 2.1E-07
	2000	0.0005	3.45-04	١				0.00		5 8.5E-08
	2000	0.0002	3.4E-04							
	0009	0,0001	3.4E-04	1.4E-05	5.9E-07	3136	4./	0.00		

Attachment C: TPA Smoke Pots

Indiana bat intake for TPA under Pasquill Category B.

TPA Concentration (g/m3)	TPA Smoke Pots								†			
TAA Concentration (g/m3)		100					-	H				Daily Chronic Intake
Daily IR Hourly IR Event IR Peco P			TPA Concentration	on (g/m3)	T T	ike Rate (m³/c	lay)	(eventlyr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
The concentration (g/m3)		Γ			Daily IR	Hourly IR	Event IR					
1	Summor Enrading/Roos	ting Inhalation										
State Stat	Summer ruguingmon	0008			3.4E-04	1.4E-05	5.9E-07	950	3.5	0.008		
4000 0.002 3.4E-04 1.4E-05 5.9E-07 950 3.5 0.008 2555 5000 0.001 3.4E-04 1.4E-05 5.9E-07 950 3.5 0.008 2555 5000 0.0005 3.4E-04 1.4E-05 5.9E-07 950 3.5 0.008 2555 7000 0.0001 3.4E-04 1.4E-05 5.9E-07 950 3.5 0.008 2555 7000 0.0001 3.4E-04 1.4E-05 5.9E-07 950 3.5 0.008 2555 7000 0.0001 3.4E-04 1.4E-05 5.9E-07 950 3.5 0.008 2555 7000 0.0001 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 3000 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 400 0.002 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 500		3000			3.4F-04	1 4F-05	5.9E-07	950	3.5	0.008		
5000 0.002 3.4E-04 1.4E-05 5.9E-07 950 3.5 0.008 2555 950 5000 0.0005 3.4E-04 1.4E-05 5.9E-07 950 3.5 0.008 2555 6000 0.0002 3.4E-04 1.4E-05 5.9E-07 950 3.5 0.008 2555 7000 0.0002 3.4E-04 1.4E-05 5.9E-07 950 3.5 0.008 2555 7000 0.0001 3.4E-04 1.4E-05 5.9E-07 950 3.5 0.008 2555 7000 0.0001 0.0001 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 4000 0.002 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 5000 0.002 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 5000 0.002 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.0		4000			2 40 04	1 45.05	5 9F-07		3.5	0.008		
5000 6000 6000 6000 6000 6000 6000 6000		2000			3.4E-04	1 4F-05	5.9E-07		3.5	0.008		
Stance Concert Conce		0000			3.4E-04	1 4F-05	5.9E-07		3.5	0.008		
State Concentration (g/m3) 3.4E-04 1.4E-05 5.9E-07 950 3.5 0.008 2.555 9.		2000			3 4E-04	1 4F-05			3.5	0.008		
Stance Cook		2000			3.4E-04	1 4F-05			3.5	0.008		9.6E-09
EF EF EF BW (kg) AT (days) Value (g/kg) (m) TPA Concentration (g/m3) Intake Rate (m³/day) Event IR EVENT (event/yr) ED (yrs) BW (kg) AT (days) Value (g/kg) 3000 9 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 4000 0.005 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 5000 0.001 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 5000 0.001 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 5000 0.0005 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 6000 0.0005 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 6000 0.0001 3.4E-04 1.4E-05 5.9E-07 950 4.7 <td></td> <td>7000</td> <td></td> <td></td> <td>1</td> <td>3</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>		7000			1	3						
TPA Concentration (g/m3)												
EF EF EF Daily Chronia (g/m3) Intake Rate (m³/day) EF BW (kg) AT (days) Daily Chronia (g/m3) (m) TPA Concentration (g/m3) Intake Rate (m³/day) (event/R) EO (yrs) BW (kg) AT (days) Value (g/kg) 3000 3 4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 5000 0.002 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 5000 0.001 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 5000 0.0005 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 5000 0.0005 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 5000 0.0005 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 5000 0.0002 3.4E-04												
EF EF BW (kg) AT (days) Value (g/kg) (m) TPA Concentration (g/m3) Intake Rate (m³/day) (event/k) ED (yrs) BW (kg) AT (days) Value (g/kg) 3000 9 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 5000 0.002 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 5000 0.002 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 5000 0.0005 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 5000 0.0005 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 5000 0.0005 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 5000 0.0005 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>												
TPA Concentration (g/m3) Intake Rate (m²/day) Eeventlyri ED (yrs) EF BW (kg) AT (days) Value (g/kg (kg) AT (days) AT (days) Value (g/kg (kg) AT (days) AT (days) Value (g/kg (kg) AT (days) AT (days) AT (days) Value (g/kg (kg) AT (days												
(m) TPA Concentration (g/m3) Intake Rate (m³day) (eventyr) ED (yrs) BW (kg) AT (days) Value (g/kg) (m) TPA Concentration (g/m3) Daily IR Houtly IR Event IR AT (days) AT (days) Value (g/kg) 3000 9 3.4E-04 1.4E-05 5.9E-07 950 4,7 0.008 2555 5000 0.002 3.4E-04 1.4E-05 5.9E-07 950 4,7 0.008 2555 5000 0.001 3.4E-04 1.4E-05 5.9E-07 950 4,7 0.008 2555 5000 0.002 3.4E-04 1.4E-05 5.9E-07 950 4,7 0.008 2555 5000 0.0005 3.4E-04 1.4E-05 5.9E-07 950 4,7 0.008 2555 6000 0.0001 3.4E-04 1.4E-05 5.9E-07 950 4,7 0.008 2555 7000 0.0001 3.4E-04 1.4E-05 5.9E-07 950 4,7 0.008 </th <th></th> <th>Diefance</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th>Ш</th> <th></th> <th></th> <th></th> <th>Daily Chronic Intake</th>		Diefance						Ш				Daily Chronic Intake
3000 9 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 4000 0.005 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 5000 0.002 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 5000 0.001 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 5000 0.001 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 5000 0.0005 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 6000 0.0002 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 7000 0.0001 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 7000 0.0001 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555		(II)	TPA Concentrati	ion (g/m3)		take Rate (m3)	(day)	(event/yr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
3000 9 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 4000 0.005 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 5000 0.002 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 5000 0.001 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 5000 0.0005 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 6000 0.0002 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 7000 0.0001 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 7000 0.0001 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555					Daily IR	Hourly IR	Event IR					
3000 9 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 4000 0.005 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 5000 0.002 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 5000 0.001 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 5000 0.0005 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 6000 0.0002 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 7000 0.0001 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 7000 0.0001 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555	Winter Hiberation Inha	lation										
0.005 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 0.002 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 0.001 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 0.0005 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 0.0002 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 0.0001 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555					3.4E-04					0.00		
0.002 3.4E.04 1.4E.05 5.9E.07 950 4.7 0.008 2555 0.001 3.4E.04 1.4E.05 5.9E.07 950 4.7 0.008 2555 0.0005 3.4E.04 1.4E.05 5.9E.07 950 4.7 0.008 2555 0.0002 3.4E.04 1.4E.05 5.9E.07 950 4.7 0.008 2555 0.0001 3.4E.04 1.4E.05 5.9E.07 950 4.7 0.008 2555 0.0001 3.4E.04 1.4E.05 5.9E.07 950 4.7 0.008 2555		1000			3.4E-04					00.00		
0.001 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 0.0005 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 0.0002 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555 0.0001 3.4E-04 1.4E-05 5.9E-07 950 4.7 0.008 2555		2005			3.4E-04					0.00		
0.0005 3.4E.04 1.4E.05 5.9E.07 950 4.7 0.008 2555 0.0002 3.4E.04 1.4E.05 5.9E.07 950 4.7 0.008 2555 0.0001 3.4E.04 1.4E.05 5.9E-07 950 4.7 0.008 2555		2002			3.4E-04							
0.0002 3.4E.04 1.4E.05 5.9E-07 950 4.7 0.008 2555 0.0001 3.4E.04 1.4E.05 5.9E-07 950 4.7 0.008 2555		2005			3.4E-04							
0.0001 3.4E.04 1.4E.05 5.9E-07 950 4.7 0.008 2555		200			3.4E-04							
		7007			3.4E-04							5 1.3E-08
											1	
		-										

- programme of the company of the

Attachment C: Titanium Dioxide Grenades

Indiana bat intake for titanium dioxide under Pasquill Category E.

										Dally Chronic Intake
	(m)	Concentration (g/m3)	Int	Intake Rate (m³/day)	lay)	EF (event/yr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
			Daily IR	Hourly IR	Event IR					
Summer Foraging/Roosting Inhalation	no Inhalation									Lo.
	100	0.01	3.4E-04	1.4E-05	5.9E-07	48	3.5	0.008		
	C.	0.005	3.4E-04	1.4E-05	5.9E-07	48	3.5	0.008		
	200	0000	3.4E-04	1.4E-05	5.9E-07	48	3.5	0.008		
	200		3.4E-04	1.4E-05	5.9E-07	48	3.5	0.008	2555	
	8		3.4E-04	1.4E-05	5.9E-07	48	3.5	0.008		
	4400		3.4E-04		5.9E-07	48	3.5	0.008		
	1800		3.4E-04		5.9E-07	48	3.5	0.008	2555	4.8E-10
	200									
	200					,				Daily Chronic Intake
	UISTANCE (m)	Concentration (g/m3)		Intake Rate (m³/day)	'day)	EF (eventlyr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
			Dally IR	Hourly IR	Event IR					
Winter Hiberation Inhalation	fion							0000		80 33 3
	100	0.01	3.4E-04					0.008		
	300	0.005	3.4E-04	1.4E-05				0.008		
	500		3.4E-04	1.4E-05	5.9E-07	7	4.7	0.008		
	2007		3.4E-04	1.4E-05	5.9E-07	7 48	4.7	0.008	3 2555	
	10001		3.4E-04	1.4E-05	5.9E-07	7 48	4.7	0.008		
	1400		3.4E-04		5.9E-07	7 48	4.7	0.008		
	1800		3.4E-04	4 1.4E-05	5.9E-07	7 48	4.7	0.008	2555	6.5E-10

Attachment D Stressor Intake - Gray bat

INTAKE PARAMETERS FOR GRAY BATS

Summer Foraging Inhalation

Parameter	Abbreviation	Definition
Distance		Number of meters from chemical source to exposure point.
		Exposure concentration.
Fog Oil Concentration		Amount of air inhaled.
Intake Rate	Delle ID	Amount of air inhaled each day.
Daily Intake Rate	Daily IR	Amount of air inhaled each hour.
Hourly Intake Rate	Hourty IR	Amount of air inhaled each nour.
Event Intake Rate	Event IR	Amount of air inhaled during each chemical release.
Exposure Frequency	EF	Number of chemical exposures per year.
Exposure Duration	ED	Estimate of time receptor will potentially be exposed to chemical.
Body Weight	BW	Mass of adult receptor.
Averaging Time	AT	Lifespan of receptor.
Daily Chronic Intake Value		Amount of chemical stressor inhaled by receptor.

Summer Foraging Ingestion

Parameter	Abbreviation	Definition
Distance		Number of meters from chemical source to exposure point.
Fog Oil Déposition		Exposure concentration.
Prey Surface Area	Prey SA	Size of area of the body surface of prey that might be covered by fog oil particles.
Prey Weight		Mass of prev
Concentration of Food Contaminant	CF	Quantity of contaminant deposited on food item.
Intake Rate		Amount of food ingested during each chemical release.
Exposure Frequency	EF	Number of chemical exposures per year.
Exposure Duration	ED	Estimate of time receptor will potentially be exposed to chemical.
Body Weight	BW	Mass of adult receptor.
Averaging Time	AT	Lifespan of receptor.
Daily Chronic Intake Value		Amount of chemical stressor ingested by receptor.

Summer Foraging Dermal Absorption

Parameter	Abbreviation	Definition
Distance		Number of meters from chemical source to exposure point.
Fog Oil Concentration		Exposure concentration.
Skin Surface Area	-	Surface area of receptor.
Absorption Factor	ABS	Degree of dermal absorption of stressor by receptor Unitless - assumed to equal 1 (100% absorption).
Exposure Frequency	EF	Number of chemical exposures per year.
Exposure Duration	ED	Estimate of time receptor will potentially be exposed to chemical.
Body Weight	BW	Mass of adult receptor.
Averaging Time	AT	Lifespan of receptor.
Dermally Absorbed Dose		Amount of chemical stressor dermally absorbed to receptor.

Parameter	Abbreviation	Definition
Distance		Number of meters from chemical source to exposure point.
Fog Oil Concentration		Exposure concentration.
Intake Rate		Amount of air inhaled.
Daily Intake Rate	Daily IR	Amount of air inhaled each day.
Hourly Intake Rate	Hourly IR	Amount of air inhaled each hour.
Event Intake Rate	Event IR	Amount of air inhaled during each chemical release.
Exposure Frequency	EF	Number of chemical exposures per year.
Exposure Duration	ED	Estimate of time receptor will potentially be exposed to chemical.
Body Weight	BW	Mass of adult receptor.
Averaging Time	AT	Lifespan of receptor.
Daily Chronic Intake Value		Amount of chemical stressor inhaled by receptor.

Maternity Cave Dermal Absorption

Parameter	Abbreviation	Definition
Distance		Number of meters from chemical source to exposure point.
Fog Oil Concentration		Exposure concentration.
Skin Surface Area	•	Surface area of receptor.
Absorption Factor	ABS	Degree of dermal absorption of stressor by receptor. Unitless - assumed to equal 1 (100% absorption).
Exposure Frequency	EF	Number of chemical exposures per year.
Exposure Duration	ED	Estimate of time receptor will potentially be exposed to chemical.
Body Weight	BW	Mass of adult receptor.
Averaging Time	AT	Lifespan of receptor.
Dermally Absorbed Dose		Amount of chemical stressor dermally absorbed by receptor.



Gray bat intake for fog oil under Pasquill Category B.

							-				
	Distance	Fog Oil Concentration (q/m³)	tration	¥	Intake Rate (m³)		EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Daily Chronic Intake Value (g/kg-day)
		}		Daily IR	Hourly IR	Event IR					
Cummor Foreging Inhalation	lation				1						
Suppose District	4000	0.01		3.4E-04	1.4E-05	2.1E-05		5.8	0.0105		
	4000	0.005		3.4E-04	1.4E-05	2.1E-05		5.8	0.0105		
	2000	0.002		3.4E-04	1.4E-05	2.1E-05		5.8	0.0105		
	2000	1000		3.4E-04	1.4E-05	2.1E-05		5.8	0.0105		
	0000	2000		3.4F-04	1.4E-05	2.1E-05		5.8	0.0105	3650	
	2000	0.000		3 45 04	1.4E-05			5.8	0.0105		
	12000	0.0001		3.4E-04	1.4E-05	2.1E-05	7.1	5.8	0.0105	3650	2.3E-09
			, coi	o accialmination		Shinn et al 1987					,
*Acute critical effects are oil pneumonia, hasa nemornaging, and convusions. Onical order.	re oil pheumon	ila, nasai nemorris	ging, aric	COLINGIAIS							
	Distance	===	Prey SA	Prey Weight		Intake Rate					
	Ê	(g/m²)	(<u>H</u>	(B)	CF (g/g)	(g/day)	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
Summer Foraging Ingestion	estion										
B	4000	0.01	3.3E-05		9.7E-05	2.5E+00			0.01		
	2000	0.005	3.3E-05		4.9E-05	2.5E+00		5.8	0.0105		
	0009		3.3E-05		1.9E-05				0.0105		
	7000	0.001	3.3E-05		9.7E-06		7.1		0.0105		
	9500		3.3E-05		4.9E-06	'			0.0105		
	14000		3.3E-05		1.9E-06		7.1	5.8	0.0105		
	8500		3.3E-05		9.7E-07	2.5E+00			0.0105	3650	2.6E-06
										-	
	Distance (m)	Fog Oil Concentration (g/m²)	ntration	Skin Surfac	Skin Surface Area (m²)	ABS	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Dose (g/kg-day)
Summer Foraging Dermal Absorption	rmal Absorption										
	4000			õ	0.026			0 0	0.00	0000	2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	2000		-	ő	0.026		1				
	0009			ő	0.026		17				
	7000			ő	0.026			0			
	9500		اء.	Ö	0.026			0			
	14000			Ö	0.026			0.00	0.0103		
	8500	0.0001	_	O	0.026		1	0		-	
			-								
	-	-	-	-			-				
		_		_	_			-			

Gray bat intake for fog oil under Pasquill Category B.

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	Distance	Fog Oil Concentration								
	(E)	(g/m³)		Intake Rate (m³)		EF (davs/vr)	ED /vre)	NIG.	ŀ	Daily Chronic Intake
			Daily IR	Hourty IR Event ID	Ī	1.5		(Ru) and	AI (days)	Al (days) Value (g/kg-day)
Maternity Cave Inhalation	ion				W WIDE					
Saltpeter #3	3682	0.01	3.4E.04	1 16 05						
Freeman	12547					[.]	5.8	0.0105	3650	1.16-06
			3.4E-04	1.4E-05	0.0E+00	7.1	5.8	0.0105		0 0F+00
	Distance	Fog Oil Concentration								
	Ê		Skin Surfac	Skin Surface Area (m²)	ARS	EE (danshir) ED ()	1		:	Dermally Absorbed
						Li (days/yr)	ED (yrs)	SW (Kg)	AT (days)	Dose (g/kg-day)
Maternity Cave Dermal Absorption	Absorption									
Saltpeter #3	3682	0.01	00	126	*	7.				
Freeman	12547	0,000		9000		7.	9.0	0.0105	3650	2.8E-04
		70000	30	970	-	7.1	5.8	0.0105	3650	5.6E-06
The state of the s										

Gray bat intake for fog oil under Pasquill Category C.

											Doily Chronic Intake
	Distance	Fog Oil Concentration	ntration	.=	Intake Rate (m³)		EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
	Ξ	(m/6)			CI THE	Event 10					
				Dally IX	nouny in						
Summer Foraging Inhalation	alation	- 20		2 45 04	1 4E.05	2.1E-05	7.1	5.8	0.0105	3650	2.3E-07
	2000	10.0		3.45.04				5.8	0.0105		1.1E-07
	2005	0000		3.4E-04		2.1E-05	7.1	5.8	0.0105		
	4000			20 00	4 4 4 05			5.8	0.0105	3650	2.3E-08
	2200			9.40				25.88	0.0105		
	7500			5.4E-04				5.8	0.0105		
	12000			3.45-04				8 4	0.0105		2.3E-09
	18500	0.0001		3.4E-04	1.4E-05			0			
		Fog Oil									
	Distance (m)	Deposition (g/m²)	Prey SA (m²)	Prey Weight (g)	CF (9/9)	Intake Rate (g/day)	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
Oumor Eorania Innestino											
2	3500		3.3E-05	3.4E-03			7.7	8 0	0.0105	3650	2.05-04
	4000		3.3E-05		-				0.0103		
	5500	0.002	3.3E-05		-				0.0100	0000	
	8000	0.001	3.35-05	ļ	-				0.000		
	12000	0.0005	3.3E-05	3.4E-03	ļ	2.5E+00		:	0.0.00	3650	5.2F-06
	24000		ļ	!				:	0000		
	40000	0.0001	3.3E-05		9.7E-07	2.5E+00				İ	
											A House
	Distance (m)	Fog Oil Concentration (g/m²)	sentration 2)	Skin Surfa	Skin Surface Area (m²)	ABS	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Dose (g/kg-day)
Summer Foraging Dermai Absorption	ermai Absorptic			-	0.026		1 7.1		0.0105		
	2000		2		0.026		1 7.1	5.8			
	1000		2 2	0	0.026		1 7.1		0.0105		
	8000			0	0.026		1 7.1				
	12000		25	0	0.026		1 7.1				
	24000		02	Ö	0.026		1 7.1				
	40000	0.0001	9	Ö	0.026		1 7.1		0.0105	OCOF C	2.05-00
	1		-		-						
					_		_				

Gray bat intake for fog oil under Pasquill Category C.

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14 Car.

	Distance	Fog Oil Concentration								
	Ê	(g/m³)		Intake Rate (m³)		EF (days/vr)	ED (vrs)	RW (kg)	AT (daye)	AT (Anna)
			Daily IR	Hourty IS Event ID	l			in in	o (days)	varue (g/kg-day)
Maternity Cave Inhalation	ou.		1		LVGIII IN					
Saltoeter #3	3682	0000	100							
	ľ		3.45-04		1.0E-04	1.1	5.8	0.0105	3650	20 30 07
rreeman	12547	0.001	3.4E-04	1.4E-05						
							2	0.0103	ncos	0.0E+00
				_						
								-		
										•
	Distance	Fog Oil Concentration		_						
	(E)	(g/m²)	Skin Surfac	Skin Surface Area (m²)	ABS	EF (davs/vr)	ED (une)	014/16-01		Dermally Absorbed
					t	11.6	616	Day (NB)	A (days)	Dose (g/kg-day)
Maternity Cave Dermal Absorption	Absorption									
Saltpeter #3	3682	0.005	00	0.026	•	1				
Freeman	-			90		[:]	2.8	0.0105	3650	1.4E-04
			0.0	0.020	-	7.1	5.8	0.0105	3650	5.6E-06
							_			

Gray bat intake for fog oil under Pasquill Category D.

Static Sillore									_	_	
	Distance	Fog Oil Concentration	tration	_	Intake Rate (m³)	٠	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Daily Chronic Intake Value (g/kg-day)
	Ê			al vied	Hourty IR	Event IR					
Summer Foraging Intralation		500		3.4F-04	1.4E-05	2.1E-05		5.8	0.0105		
	Once	10.0		3 4F-04		2.1E-05	7.1	5.8	0.0105		
	4500	COOTO		2 4				5.8	0.0105		
	6500	0.002		3.45-04				5.8	0.0105	3650	2.3E-08
	8200	0.001		3.45-04				0 4	00105		1.15-08
	12500	0.0005		3.46-04	į	2.15-05	7	0 0	200	0996	-
	22500	0.0002	:	3.4E-04				5.8	0.010.0		
	35500	0.0001		3.4E-04		2.1E-05	7.1	2.8	C010.0		7
		Fog Oil									
	Distance (m)	<u> </u>	Prey SA (m²)	Prey Weight (g)	CF (g/g)	Intake Rate (g/day)	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Daily Chronic Intake Value (g/kg-day)
Summer Foraging Ingestion			20.00	1	9 7E-05	2 5E+00	1,7	5.8	0.0105		
	9200	10.0	20.00	3 4 1 03	Ì			5.8	0.0105		
	0058	0000	2 25 05					5.8	0.0105		
	14000	0.002	200	3 VE 03			7.1	5.8	0.0105		
	22000	0.00	3.25.05					5.8	0.0105	5 3650	
	20000		2 25 05				7.1	5.8	0.0105	-	
	+00006		20 75 6			7 2.5E+00	7.1	5.8	0.0105		0 2.6E-06
	*+0000c	1000.0	10.0								
											Dermally Absorbed
	Distance	Fog Oil Concentration (q/m²)	entration	Skin Surf	Skin Surface Area (m²)	ABS	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	
Summer Foraging Dermal	ermal Absorption						,	ď	50105	3650	30 2.8E-04
			į		0.026						
	8500		2		0.026		1,1				
	14000		~		0.026			0 4			
	22000	0.001			0.026						
	35500		2		0.026						
	+00005		22		0.026						
	++00005	0.0001	=	-	0.026						
				1	-						
								-			

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Gray bat intake for fog oil under Pasquill Category D.

	Distance	Fog Oli Concentration								
	Ē	(g/m²)		Intake Rate (m³)		EF (days/vr)	ED (vrs.)	RW (be)	47.74	Daily Chronic Intake
		_	Daily IR	Hoteldy ID				(Ru)	AI (days)	Varue (g/kg-day)
Maternity Cave Inhalation	ion				EVGIII III					
Saltoeter #3	3687	3000	1							
			3.45-04	1.4E-05	1.05.04	7.1	ď	00400		
rreeman	12547	0.0005	3.4E-04	1.4E-05		7.4	200	0.0100		5.4E-07
							9.0	0.0105	3650	0.0E+00
	Distance	Fog Oil Concentration								
	(m)	(g/m²)	Skin Surfa	Skin Surface Area (m²)	ABS	EE (dayshirt)	1			Dermally Absorbed
					ı	Li (uaysiyi)	ED (yrs)	BW (kg)	AT (days)	Dose (g/kg-day)
Maternity Cave Dermal Absorption	Absorption									
Saltpeter #3	3682	0.01		0.026						
Freeman	12547	0.002		0.00		F.)	5.8	0.0105	3650	2.8E-04
			1	250		7.1	5.8	0.0105	3650	5.6E-05
									+	The second secon

Gray bat intake for fog oil under Pasquill Category E.

## Fog Oil Concentration Baily IR Baily	Intake Rate (m²) Hourly IR Ev 1.4E-05 1.4E-05 1.4E-05 1.4E-05 1.4E-05 1.4E-05	(m) Event IR Event IR 2 1 1 E 0 5 5 2 1 E 0 5 5 5 2 1 E 0 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5		EÓ (yrs)	BW (kg)	AT (days)	Daily Chronic Intake Value (g/kg-day)
1900 19m	tourty IR Ev 1.4E-05 1	1E-05	11		0.0105		
4000 0.01 3.4E-04 5000 0.005 3.4E-04 5000 0.005 3.4E-04 14000 0.0005 3.4E-04 50000 0.0005 3.4E-04 50000 0.0001 3.3E-05 3.4E-03 10000 0.0001 3.3E-05 3.4E-03 3.0000 0.0005 3.3E-05 3.4E-03 3.0000 0.0005 3.3E-05 3.4E-03 3.0000 0.0005 3.3E-05 3.4E-03 3.6000 0.0005 3.3E-05 3.4E-03 3.6000 0.0000 3.3E-05 3.4E-03 3.4E-03 3.6000 0.0000 3.3E-05 3.4E-03 3.4E-03 3.6000 0.0000 3.3E-05 3.4E-03 3.4E-03 3.6000 0.0000 3.3E-05 3.4E-03 3.4E-03 3.6000 0.0000 3.3E-05 3.4E-03 3.4E-03 3.6000 0.0000 3.3E-05 3.4E-03 3.4E-03 3.6000 0.0000 3.3E-05 3.4E-03 3.6000 0.0000 3.3E-05 3.4E-03 3.6000 0.000	1.4E.05 1.4E.05 1.4E.05 1.4E.05 1.4E.05 1.4E.05 1.4E.05 1.4E.05 1.4E.05	2.1E-05	i		0.0105		
1000	1.4E.05 1.4E.05 1.4E.05 1.4E.05 1.4E.05 1.4E.05 1.4E.05 1.4E.05 1.4E.05 1.4E.05	2.1E-05	1		0.0105	-	
According According According	1.4E.05 1.4E.05 1.4E.05 1.4E.05 1.4E.05 1.4E.05	2.1E-05	7	5.8		3650	2.3E-07
Secondary Secondary Secondary	1.4E-05 1.4E-05 1.4E-05 1.4E-05 1.4E-05	20.7		a c	0 0105		1.1E-07
9000 0.002 3.4E-04 3.4E-04 55000 0.0001 3.4E-04 550000 0.0002 3.4E-04 550000 0.0002 3.4E-04 550000 0.0001 3.4E-04 6.0001 3.4E-03 6.0001 3.4E-03 6.0001 0.0001 3.4E-03 3.4E-03 6.0001 0.0001 3.4E-03 3.4E-03 6.0001 0.0001 3.4E-03 3.4E-03 6.0001 0.0001 3.4E-03 6.0001 0.0001 3.4E-03 6.0001 0.0001 3.4E-03 6.0001 0.0001 3.4E-03 6.0001 0.0001 3.4E-03 6.0001 0	14E-05 14E-05 14E-05 14E-05	20.74	7.4	a c	0 0105		4.5E-08
14000	14E-05 14E-05 14E-05 14E-05	2.15-05) u	0.0105		2.3E-08
24000 0.0005 3.4E-04	1.4E-05 1.4E-05 1.4E-05	2.1E-05	F.)	0.0	0.0103		4 45 08
S0000	1.4E-05	2.1E-05	7.1	5.8	0.0105		
Second- Condit 3.4E-04 Condit Stance Condit	1.4E-05	2.1E-05	7.1	5.8	0.0105		
trance Deposition Prey SA Press (m) (g/m²) (m²) (m²) (m²) (m²) (m²) (m²) (m²) (2.1E-05	7.1	5.8	0.0105	3650	2.3E-09
trance Deposition Prey SA Pres (m) (g/m²) (m³) (m³) (m³) (m³) (m³) (m³) (m³) (m³							
(m) Prey SA Press Pres							
7500 0.01 3.3E-05 10000 0.005 3.3E-05 30000 0.000 3.3E-05 50000+ 0.0005 3.3E-05 50000+ 0.0002 3.3E-05 50000+ 0.0002 3.3E-05 50000+ 0.0002 3.3E-05 60000+ 0.0002 3.3E-05 60000+ 0.0002 0.3E-05 60000+ 0.0002 0.3E-05 60000+ 0.0001 0.3E-05 60000+ 0.0001 0.3E-05 60000+ 0.0001 0.3E-05 60000+ 0.0001 0.3E-05 60000+ 0.0001 0.3E-05 60000+ 0.0001 0.3E-05 60000+ 0.0001 0.3E-05 60000+ 0.0001 0.0001 0.3E-05 60000+ 0.0001 0.0001 0.3E-05 60000+ 0.0001 0.0001 0.3E-05 60000+ 0.0001 0.0001 0.3E-05 60000+ 0.0001 0.0001 0.0001 0.3E-05 60000+ 0.0001 0.	CF (g/g)	Intake Rate (g/day)	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Daily Chronic Intake Value (g/kg-day)
7500 0.01 3.3E-05 10000 0.005 3.3E-05 18000 0.002 3.3E-05 50000+ 0.0005 3.3E-05 50000+ 0.0001 3.3E-05 50000+ 0.0001 3.3E-05 60000+ 0.0001 3.3E-05 60000+ 0.0001 3.3E-05 60000+ 0.0001 3.3E-05 60000+ 0.0001 3.3E-05 60000+ 0.0001 3.3E-05 60000+ 0.0001 3.3E-05 60000+ 0.0001 3.3E-05 60000+ 0.0001 3.3E-05 60000+ 0.0001 0.0001 0.0001 0.0001							
6.0005 3.3E-05 0.002 3.3E-05 0.001 3.3E-05 0.0005 3.3E-05 0.0001 3.3E-05 0.0001 3.3E-05 0.0001 3.3E-05 0.0001 3.3E-05 0.0001 3.3E-05	9.7E-05	2.5E+00	7.1	5.8	0.0105		
6.0002 3.3E-05 0.001 3.3E-05 0.0002 3.3E-05 0.0002 3.3E-05 0.0001 3.3E-05 0.0001 3.3E-05 0.0001 3.3E-05 0.0001 0.3E-05 0.0001 0.0001		2.5E+00		5.8	0.0105		
0.0001 3.3E-05 0.0005 3.3E-05 0.0001 3.3E-05 0.0001 3.3E-05 0.0001 3.3E-05 0.0001 3.3E-05 0.0001 3.3E-05 0.0001 3.3E-05		2.5E+00		5.8	0.0105		
60000000000000000000000000000000000000		2.5E+00			0.0105		
Fog Oil Concentration (g/m³)	-	2.5F+00		İ	0.0105		
Fog Oil Concentration (g/m³)	1 95.06	2.5E+00	7.1		0.0105		5.2E-06
Fog Oil Concentration (g/m²)	į	2 5F+00	1	:	0.0105		
Fog Oil Concentration (g/m²)							
Fog Oil Concentration (g/m²)							
Fog Oil Concentration (g/m²)							
Fog Oil Concentration (g/m²)							
	se Area (m²)	ABS	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Dermally Absorbed Dose (g/kg-day)
100							
-			7.4		0.0105	3650	0 2.8E-04
0.01	970			5.8			
	970		7.1				
0.002	920		7.1				
100.0	920		7.1			j	
	026		7.1	5.8	0.0105	3650	
0,0001	026		7.1				.0 2.8E-06
The state of the s				-			

Gray bat intake for fog oil under Pasquill Category E.

	Distance	Fog Oil Concentration								
	(m)	(g/m³)		Intake Rate (m³)		1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	i			Daily Chronic Intake
			Daily IR	House to		Er (days/yr) ED (yrs)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
Maternity Cave Inhalation	5			LIGHT IN	EVENT IN					
Saltneter #3	3682	200								
	ľ		3.4E-04	1.4E-05	1.05-04	7.1	9	2000		
Freeman	12547	0.001	3.4E-04	1 4F.05			0	CULUIO	3650	1.1E-06
						7	5.8	0.0105	3650	0.0F+00
	Distance	Fog Oil Concentration								
	Œ)	(g/m²)	Skin Surface Area (m²)	B Area (m²)	988	1	i		•	Dermally Absorbed
					1	er (uays/yr)	ED (yrs)	BW (kg)	AT (days)	
Maternity Cave Dermal Absorption	Absorption									
Saltpeter #3	3682	0.01	9000	90						
Freeman	12547	0000	2 6	3 5	-	7.1	5.8	0.0105	3650	A D E C
		3000	0.026	97	-	7.1	5.8	0.0105		10-10-10-10-10-10-10-10-10-10-10-10-10-1
									3	CO-20.C
	.								_	

Attachment D: Fog Oil - Mobile Smoke

Gray bat intake for fog oil under Pasquill Category B.

Mobile Smoke	_							_			
Hopir direct											
	Distance	Fog Oil Concentration	entration		intake Rate (m³)	•	EF (davs/vr)	ED (vrs)	BW (kg)	AT (days)	Daily Chronic Intake Value (g/kg-day)
	Ē	111/61		,							
				Dally IK	HOURIY IN	EVEILLIN					
Summer Foraging inhalation				70 97 6	4 45.05	3 55.05		5.8	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		1.3E-06
	4000			3.45.04			25.3	5.8	0.0105	3650	6.7E-07
	9008			200				8.5	0.0105		2.7E-07
	4000			3.40-04		3.56		86	0 0105		1,3E-07
	2000			3.45-04	1			2	0.0100		R 7E.08
	2000		2	3.4E-04	1.4E-05			0.0	0.0100		975.0
	7000		2	3.4E-04				9.0	0.0105		
	0006	0.0001	1	3.4E-04	1.4E-05	3.5E-05	25.3	5.8	0.0105	3650	1.3E-08
							-				
	Distance	Feg Oil Deposition	Prey SA	Prev Weight		Intake Rate					Dally Chronic Intake
	ε	(a/m²)	E.	9	CF (9/g)	(g/day)	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
						Dally IR					
Summer Foraging Ingestion	stlon										
		0.01	3.35-05					5.8	0.0105	3650	
	2000	0.005	3.3E-05	3.4E-03	4.9E-05			5.8	0.0105	İ	
	0009							5.8	0.0105		
	7500				9.7E-06			5.8	0.0105		
	9500						25.3	5.8	0.0105		
	14500			3.45-03	1.9E-08			5.8	0.0105		
	9500					2.5E-03			0.0105	3650	9.3E-08
	Distance	Fog Oil Concentration	entration								Dermally Absorbed
	Œ	(g/m²)		Skin Surfa	Skin Surface Area (m²)	ABS	EF (daystyr)	ED (yrs)	BW (kg)	AT (days)	Dose (g/kg-day)
Contract Company Absorbion	Absorption										
Commission of Spirity Com	4000	000		0	0.026		25.3	5.8	0.0105		
	2000		2	o	0.026		25.3	5.8	0.0105	3650	
	0009		2	Ö	0.026	_	25.3	5.8	0.0105		
	7500		_	o	0.026	_	25.3	5.8	0.0105		1.0E-04
	9500		2	o	0.026	•	25.3	5.8	0.0105		
	14500		22	Ö	0.026	1	25.3	5.8	0.0105		
	8500		=	Ö	0.026	-	25.3	5.8	0.0105		1.0E-05
	-	_		_							

Gray bat intake for fog oil under Pasquill Category B.

	Distance	Fod Oil Concentration								
	Ê	(g/m³)		Intake Rate (m³)	£	EF (dava/vr)	ED (vrs)	RW (kg)	AT (daye)	Dally Chronic Intake
			Daily IR	Hourly IR	Event IR			(Au)	(days)	value (g/kg-day)
Maternity Cave Inhalation	_									
Musgrave Hollow										
Saltpeter #3	5447	0.001	3.4E-04	1 4F-05	8 25.05		1			
Freeman	13104	0	3.4F-04	1.45.05	00.00	20.0	0.0	COLO.0		
Baily McCann Hollow				2011	OCT OC		9.0	0.0105	3650	0.0E+00
Saltpeter #3	2004	0.01	3.4F-04	1 4F_05	100	000	1			
Freeman	_	0	3.4E.04	1 45 06	10-10 c	0.61	9.8	0.0105		
Mush Paddle Hollow			1	CO-34-1	0.05+00	19.0	5.8	0.0105	3650	0.0E+00
Saltpeter #3	1751	0.01	3.45-04	1 4E 05	10.00	0.07	1			
Freeman	16542	0	2 45 04	20-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1	1.05-04	9.0	9.0	0.0105		2.5E-06
Ballard Hollow			100	1.45-03	0.0=+00	15.5	5.8	0.0105	3650	0.0E+00
Saltpeter #3	13821	0	3.4F-04	1 4E.05	00000					
Freeman	11266		2 45 04	30 27 7	300	17.7	0.0	C010.0		0.0E+00
			20.31	CD-118.	0.0E+00	12.7	5.8	0.0105	3650	0.0E+00
	Distance	Fog Oil Concentration								
	(E)	(g/m²)	Skin Surface Area (m²)	• Area (m²)	ABS	EF (dava/vr)	ED (vrs)	RW (kg)	AT (daye)	Dermaily Absorbed
								(Ku)	(rays)	Dose (g/kg-day)
Maternity Cave Dermal Absorption	bsorption									
Musgrave Hollow										
Saltpeter #3	5447	0.002	0.026	56	-	25.3	8 4	90000	0.00	
Freeman	13104	0.0002	0.026	92		2 42	2 4	0.0103	neas	2.0E-04
Baily McCann Hollow						20.0	000	COLO.O	3630	2.0E-05
Saltpeter #3	2004	0.01	0.026	97	-	0.01	8,4	0.000	0300	
Freeman	12024	0.0002	0.026	92	-	40.0	9	9000	0000	/.DE-04
Mush Paddle Hollow						2	ò	0000	Ocas	1.5E-05
Saltpeter #3	1761	0.01	0.028	92	-	44.	8	4000	0000	
Freeman	16542	0.0001	0.026	90		2 4	9 4	00.00	Ocas	6.2E-04
Ballard Hollow						2	25	0.0103	ncos	6.2E-06
Saltpeter #3	13821	0.0002	0.02	99	-	101	ď	9000	0300	
Freeman	11266	0.0002	0.026	9	-	127	8	2000	0000	1.0E-03

Gray bat intake for fog oil under Pasquill Category C.

Mobile Smoke											
	Distance	Fog Oil Concentration	ntration	_	Intake Rate (m³)	ę.	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Daily Chronic Intake Value (g/kg-day)
				Dally IR	Hourly IR	Event IR					
Complete Inhalation	do				Γ						
Company of the company		0.01		3.4E-04	1.4E-05	3.55-05		5.8	0.0105		1.35-00
	2005	900 0		3.4E-04	1.4E-05	3.5E-05		5.8	0.0105		6.7E-07
	2000	000		3.4E-04				5.8	0.0105		2.7E-07
	3000	0.00		3.4E-04				5.8	0.0105		1.3E-07
	2000			2 46 04				5.8	0.0105	3650	6.7E-08
	6500			3.40-04			25.3	8.6	0.0105	3650	2.7E-08
	9500	0.0002		3.4E-04				a v	0.0105	3650	1.3E-08
	14000	0.001		3.4E-04	1.4E-05	3.55-05		0.0	20.00		
								1			
	Distance	Pog Oil Deposition	Prey SA	Prey Weight		Intake Rate					Dally Chronic Intake
	(1)	(a/m²)	Œ	(B)	CF (9/g)	(g/day)	EF (daysfyr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
						Dally IR					
Summer Foraning Ingestion	tlon										70.00
Sun Sun Sun Sun Sun Sun Sun Sun Sun Sun	1		3.3E-05	3.4E-03							
	4000										
	2000	0.002				2.5E-03	25.3			3650	
	8500		1								
	0000		ì								
	2007		3.3F-05					5.8			
	20004	0 0004	3.35-05						0.0105		9.3E-09
	2000		3								
	100	Fod Oll Concentration	entration								۵
	E (E)	(a/m²)	_	Skin Surfa	Skin Surface Area (m²)	ABS	EF (daysfyr)	ED (yrs)	BW (kg)	AT (days)	Dose (g/kg-day)
Summer Foraging Dermal Absorption	mal Absorption									3650	1.08-03
	3000			o	0.026		20.3				
	4000	0.005	2	o	0.026		25.3				
	2000	0.002	2	0	0.026		1 25.3				
	8500		-	o	0.026		1 25.3		0.0105	3650	
	1200		2	Ö	026		1 25.3				
	2000		12	o	0.026		1 25.3		0.0105		
	0000			0	0.026		1 25.3	5.8			1.0E-05
	-										
				L							

Gray bat intake for fog oil under Pasquill Category C.

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	_									
	Distance (m)	Fog Oil Concentration		1	•					Daily Chronic Intake
			200	=1	1.1	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Value (a/ka-dav)
Maternity Cave Inhalation	5			Hourly IR	Event iR					//
Musgrave Hollow										
Saltneter 40										
1910		0.0005	3.4E-04	1.4E-05	ĺ	28.2	0 4	1000		
Freeman	13104	0.0001	3.4E-04	1.4E.05	00100		0.0	0.0105		1.6E-07
Bally McCann Hollow				20		6.03	5.8	0.0105	3650	0.0E+00
Saltpeter #3		0.01	3.45.04	l						
Freeman	12024		יייי ליייי				5.8	0.0105	3650	305.06
Mush Paddle Hollow			3.45-04	1.4E-05	0.0E+00	19.0	5.8	0.0105		0 0F+00
Saltpeter #3	1751	000								
Freeman	-	10.0	3.4E-04	1.4E-05	1.0E-04	15.8	5.8	0 0105	3650	20.00
Ballard Hollow		0.000	3.4E-04	1.4E-05	0.0E+00	15.8	5.8	0.0105		00-10-00 00-10-00
Saltpeter #3	13821	10000								00-10-10-10-10-10-10-10-10-10-10-10-10-1
Freeman		10000	3.45-04	1.4E-05	0.0E+00	12.7	5.8	0.0105	3650	00.70
		200.0	3.4E-04	1.4E-05	0.0E+00	12.7	5.8	0.0105	3650	0.00+00
										0.0E+00
									1	
	Distance	Fog Oll Concentration			-					
	(E)	(g/m²)	Skin Surface Area (m²)	Area (m²)	900			_		Dermaily Absorbed
					T	Er (daysiyr)	ED (yrs)	BW (kg)	AT (days)	Dose (g/kg-dav)
Maternity Cave Dermai Absorption	bsorption									
Musgrave Hollow										
Saltpeter #3		0.001	9000							
Freeman	13104	0.0002	9000			25.3	5.8	0.0105	3650	1.0F-04
Bally McCann Hollow			7.00			25.3	5.8	0.0105	3650	2.0E-05
Saltpeter #3	2004	0.01	0.006		1					
Freeman	12024	0.0005	0.026		-	19.0	5.8	0.0105	3650	7.5E-04
Mush Paddle Hollow					-	19.0	5.8	0.0105	3650	3.7E-05
Saltpeter #3	1761	0.01	9000		+					
Freeman	16542	0.0002	9000		= -	15.8	5.8	0.0105	3650	6.2E-04
Ballard Hollow			-			15.8	5.8	0.0105	3650	1.2E-05
Saltpeter #3	13821	0.0002	9000						-	
Freeman	11266	0.0005	070.0			12.7	5.8	0.0105	3650	1 DE 05
		0.000	0.026	_	-	,				

Gray bat intake for fog oil under Pasquill Category D.

MODILE OFFICE											
	Distance (m)	Fog Oll Concentration	ntration	_	Intake Rate (m³)	ç	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Dally Chronic Intake Value (g/kg-day)
	Ē			of other	al Aprion	Event IR					
Jodes Comment	, ion										
Summer roraging initiation	2600	100		3.4E-04	1.4E-05			5.8	0.0105		1.3E-06
	2005	9000		3.4E-04		3.5E-05		5.8	0.0105	3650	6.7E-07
	4500	0000		3.4E-04				5.8	0.0105		
	000	1000		3 4E-04				5.8	0.0105	0998	
	9600	90000		3.4E-04				5.8	0.0105		
	0000			3.4F-04				5.8	0.0105		
	26500			3.4E-04			25.3	5.8	0.0105	3650	1.3E-08
	20007				L						
		Fag OII	A	2		Interior					Daily Chronic Intake
	Distance (m)	(a/m²)	(E) (a)	CF (a/a)	(Apple)	EF (dayslyr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
						Dally IR					
Cummer Foreging Indestion	ion										
R. R. R. S. L. S.	6500	0.01	3.3E-05						0.0105		
	8500								0.0105		
	14500								0.0105	3650	
	22000	0,001	3.3E-05		9.7E-06				0.0105		
	35500		ļ				25.3		0.0105		
	+00009	0.0002		3.4E-03	1.95-06				0.0105	ļ	
	\$0000+		3.3E-05		9.7E-07	2.5E-03		5.8	0.0105	3650	9.35-09
		golfterfragang 100 and	antentan.								Dermally Absorbed
	(E)	(a/m²)	,	Skin Surfac	Skin Surface Area (m²)	ABS	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Dose (g/kg-day)
Summer Foraging Dermal Absorption	nal Absorption									2050	4 OE-03
	6500			ŏ	0.026		25.3		0.0100		
	8500		2	ő	0.026		20.3				2000
	14500		2	ő	970.0		25.3				
	22000		_	Ö.	0.026		25.3				
	35500		φ	ō	0.026		25.3	5.8		3650	
	+00009+		12	ō	026		25.3				
	\$0000+		7	0	0.026		1 25.3			3650	
	_	_	_	_				_			_

Gray bat intake for fog oil under Pasquill Category D.

	Distance (m)	Fog Oil Concentration		fred to the factor of the fact	4					Daily Chronic Intake
			Cotto. 10	make Kate (n	12	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-dav)
Maternity Cave Inhalatio	5		Dally IR	Houny IK	Event IR					
Musgrave Hollow										
Saltpeter #3	5447	0.001	3.4F.04	4 40 00						
Freeman		0 0000	200		8.3E-05		5.8	0.0105		1.1F-10
Bally McCann Hollow		1	97-04	1.4E-03	0.0E+00	25.3	5.8	0.0105	3650	0.0F+00
Saltpeter #3	2004	0.01	2 45 04	10 37 7						
Freeman	-	0.0002	3 45 04	1.45-05	1.0E-04	19.0	5.8	0.0105	3650	1.05-09
Mush Paddie Hollow			5.4E-04	1.4E-US	0.0E+00	19.0	5.8	0.0105		0.0E+00
Saltpeter #3	1751	0.01	3.45.04	1 45.05	10.00					
Freeman	16542	0.0002	3.4E-04	1 45.05	0.05-04	15.8	5.8	0.0105		8.4E-10
Ballard Hollow					0.05400	8.61	5.8	0.0105	3650	0.0E+00
Saltpeter #3	13821	0.0002	3.4F.04	1 15 06						
Freeman	11266	0.0002	3 45.04	20 27	0.00+00	12.7	5.8	0.0105	3650	0.0E+00
			10.0	CO-21	0.05+00	12.7	5.8	0.0105		0.05+00
	Distance (m)	Fog Oil Concentration (a/m²)	Skin Surface And (-2)	£ 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,						Dermally Absorbed
			200	(III)	ABS	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Dose (a/ka-dav)
Maternity Cave Dermal Al	bsorption									
Musgrave Hollow										
Saltpeter #3	5447	0.01	9000		1					
Freeman	13104	0.002	9000			25.3	5.8	0.0105	3650	1.0E-03
Bally McCann Hollow						26.3	5.8	0.0105	3650	2.0E-04
Saltpeter #3	2004	0.01	0.026	4	1					
Freeman	12024	0.002	9000		-	0.61	5.8	0.0105	3650	7.5E-04
Mush Paddle Hollow					-	19.0	5.8	0.0105	3650	1.5E-04
Saltpeter #3	1751	0.01	0.00		1					
Freeman	16542	0.001	0.026		- -	8.0	5.8	0.0105	3650	6.2E-04
Ballard Hollow						20.00	5.8	0.0105	3650	6.2E-05
Saltpeter #3	13821	0.002	0 028		,	-				
Freeman	11266	0.002	0.026		- -	12./	5.8	0.0105	3650	1.0E-04

Gray bat intake for fog oil under Pasquill Category E.

		_									
Mobile Smoke			1								
	Distance	Fog Oll Concentration	ntration	-	Intake Rate (m³)	•5	EF (daysfyr)	ED (yrs)	BW (kg)	AT (days)	Daily Chronic Intake Value (g/kg-day)
	(E)	(m/B)			Illiano mare in	9,7					
				Dally IR	Hourly IK	Event In					
Summer Foraging Inhaiation	ation					90 29 0		8	0.0105	Ì	1.3E-06
		0.01		3.4E-04					0.0105	3650	6.7E-07
	4000	0.005		3.4E-04					0.0105		2.7E-07
	7000	0.002		3.4E-04	١		6.62	8	0 0 0 0 0 0 0 0 0 0 0 0 0		1.3E-07
	10000	0.001		3.4E-04					0.0105		
	16000	0.0005		3.4E-04	-				0.00		
	30000	0.0002		3.4E-04	ļ				2010.0		
	20000	0.0001		3.4E-04	1.4E-05	3.5E-05		9.8	0.010		
	20000										
		Fog Oil		77-1-17							Daily Chronic Intake
	Distance	Deposition	Prey SA	Prey Weignt	CF (a/a)	(a/day)	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
	Ē	/				Dally IR					
Summer Foraging ingestion	Stion	100	3 3E-05	3.4E-03	9.7E-05						
	2007		3 35 05		L	5 2.5E-03			0.0105	3650	
	0000	2000	20.75.05					5.8			
	18000		30.00		١			5.8			
	30000		İ			2.5E-03		5.8	0.0105	5 3650	
	20000		١					5.8	0.0105		
	\$0000÷						25.3				9.3E-09
	20000++	0.0001	3.3E-05	3.4E-03	9.75-07						
	Distance	Fog Oil Concentration	entration		•					AT (4m/e)	Desmally Absorbed
	E	(g/m²)	ار	Skin Suria	Skin Surface Area (m²)	ABS	EF (days/yr)	ED (yrs)	Dw (vB)		╄
Summer Foraging Dermal Absorption	mal Absorption						2,46	5.8	0.0105	3650	1.0E-03
	7500			Ö	0.026		263				5.0E-04
	10000		9	Ö	0.026		200				
	18000		2	o	0.026		707				
	30000	0.001	4	Ö	0.026		107				
	20000		35	o	0.026		20				
	+00000		22	Ö	0.026		1 25.	5.8		2660	
	50000++	0.0001	5	Ö	0.026		1 25.		0.010		
										-	
			_								
					L		_	_	_		

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Gray bat intake for fog oil under Pasquill Category E.

	Distance	: · · · · · · · · · · · · · · · · · · ·	!							
	(m)	(a/m²)		Interior Beds (s. 3)	á					Daily Chronic Intake
				탉		EF (days/yr)	ED (yrs)	BW (kg)	AT (dava)	Value follondard
Maternity Cave Inhalation	uc.		Dally IK	Hourly IR	Event IR					(App. Rush)
Musgrave Hollow										
Saltpeter #3	3 5447	0.002	3.45.04	20 27						
Freeman	-	0 0005	2 47 04	1.4E-UO	8.3E-05	25.3	5.8	0.0105	3650	0.45
Bally McCann Hollow			5.40-04	1.4E-05	0.0E+00	25.3	5.8	0.0105		0.05400
Saltpeter #3	2004	000	2 45 04							2.05
Freeman	-	0.0005	3.45.04	1,41,00	1.0E-04	19.0	5.8	0.0105	3650	4 00 00
Mush Paddle Hollow			3.40-04	1.4E-05	0.0E+00	19.0	5.8	0.0105		50-00-00 C
Saltpeter #3	1751	0.01	2 45 04							Y. O. T.
Freeman	16542	0.0005	2 45 04	1.4	1.0E-04	15.8	5.8	0.0105		A 45.10
Ballard Hollow			- O O O O O O O O	1.4E-05	0.0E+00	15.8	5.8	0.0105	3650	00-50
Saltpeter #3	13821	0 0005	3 47 04							20.0
Freeman	11266	0 0005	0.40-04	1.4E-05	0.0E+00	12.7	5.8	0.0105		00.30.0
			0.4E-U	1.45-05	0.0E+00	12.7	5.8	0.0105	3650	001.00
										100
	Dietance	For Oll Contact					1			
	Œ	(g/m²)	Skin Surface Area (m²)	Area (m²)	ABS	EF (davelve)	1			Dermally Absorbed
					T	114,000	ED (VIS)	BW (kg)	AT (days)	Dose (g/kg-day)
Maternity Cave Dermal Ab	bsorption						_			
Musgrave Hollow										
Saltpeter #3	5447	0.01	9000	1						
Freeman	13104	0.002	0.02		=	25.3	5.8	0.0105	3650	4 00 03
Bally McCann Hollow			0.020		=	25.3	5.8	0.0105	3650	2.0E-04
Saltpeter #3	2004	0.01	9000	1					-	20.7
Freeman	12024	0.002	0.000			19.0	5.8	0.0105	3650	7.5F.04
Mush Paddle Hollow			20.0		-	19.0	5.8	0.0105	3650	1 SE.O4
Saltpeter #3	1751	0.01	9000							
Freeman	16542	0.002	0.028		- -	15.8	6.8	0.0105	3650	6.2E-04
Ballard Hollow			-		+	15.8	6.8	0.0106	3650	1 2F.04
Saltpeter #3	13821	0.002	0 000							
Freeman	11266	0.002	9000		-	12.7	5.8	0.0105	3650	1.0F-04

Attachment D: Terephthalic Acid (TPA) Grenades

Gray bat intake for TPA under Pasquill Category B.

Pickence Pickence											
(m) TPA Concentration (g/m3) Intake Rate (m³/day) Event IR Event UR EV Profits EBW (kg) A 3000 9 3.4E-04 1.4E-05 5.9E-07 1588 5.8 0.0105 4000 0.0002 3.4E-04 1.4E-05 5.9E-07 1588 5.8 0.0105 5000 0.0002 3.4E-04 1.4E-05 5.9E-07 1588 5.8 0.0105 5000 0.0002 3.4E-04 1.4E-05 5.9E-07 1588 5.8 0.0105 5000 0.0002 3.4E-04 1.4E-05 5.9E-07 1568 5.8 0.0105 5000 0.0002 3.4E-04 1.4E-05 5.9E-07 1568 5.8 0.0105 5000 0.0002 3.4E-04 1.4E-05 5.9E-07 1568 5.8 0.0105 6000 0.0002 3.4E-04 1.4E-05 5.9E-07 1568 5.8 0.0105 600 0.0002 3.4E-04 1.4E-05 5.9E-07 3136 <th>TPA Smoke Grenade</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>	TPA Smoke Grenade										
(m) TPA Concentration (g/m3) Intake Rate (m³/day) Revent IR Event IR Event IR BW (kg) 3000 9 3.4E-04 1.4E-05 5.9E-07 1568 5.8 0.0105 4000 0.002 3.4E-04 1.4E-05 5.9E-07 1568 5.8 0.0105 4000 0.002 3.4E-04 1.4E-05 5.9E-07 1568 5.8 0.0105 5000 0.0002 3.4E-04 1.4E-05 5.9E-07 1568 5.8 0.0105 5000 0.0002 3.4E-04 1.4E-05 5.9E-07 1568 5.8 0.0105 5000 0.0001 3.4E-04 1.4E-05 5.9E-07 1568 5.8 0.0105 6000 0.0001 3.4E-04 1.4E-05 5.9E-07 1568 5.8 0.0105 6000 0.0001 3.4E-04 1.4E-05 5.9E-07 1568 5.8 0.0105 6000 0.0001 3.4E-04 1.4E-05 5.9E-07 3136 5.8 <th></th> <th>Distance</th> <th></th> <th></th> <th>•</th> <th></th> <th>H .</th> <th>i</th> <th>100</th> <th>AT (40.00)</th> <th>Daily Chronic Intake</th>		Distance			•		H .	i	100	AT (40.00)	Daily Chronic Intake
3000 9 3.4E-04 1.4E-05 5.9E-07 1568 5.8 0.0105 4000 0.005 3.4E-04 1.4E-05 5.9E-07 1568 5.8 0.0105 4000 0.005 3.4E-04 1.4E-05 5.9E-07 1568 5.8 0.0105 4000 0.0002 3.4E-04 1.4E-05 5.9E-07 1568 5.8 0.0105 5000 0.0002 3.4E-04 1.4E-05 5.9E-07 1568 5.8 0.0105 5000 0.0002 3.4E-04 1.4E-05 5.9E-07 1568 5.8 0.0105 5000 0.0002 3.4E-04 1.4E-05 5.9E-07 1568 5.8 0.0105 5000 0.0002 3.4E-04 1.4E-05 5.9E-07 1568 5.8 0.0105 5000 0.0002 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0105 5000 0.0002 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0105 5000 0.0002 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0105 5000 0.0002 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0105 5000 0.0002 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0105 5000 0.0002 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0105 5000 0.0002 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0105 5000 0.0002 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0105 5000 0.0002 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0105 5000 0.0002 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0105 5000 0.0002 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0105 5000 0.0002 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0105 5000 0.0002 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0105 5000 0.0002 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0105 5000 0.0002 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0105 5000 0.0002 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0105 5000 0.0002 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0105 5000 0.0002 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0105 5000 0.0002 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0105 5000 0.0002 0.0002 0.0002 0.0002 0.0002 0.0002 5000 0.0002 0.0002 0.0002 0.0002 0.0002 0.0002 5000 0.0002 0.0002 0.0002 0				1 1	ake Rate (m³/	day)	(eventlyr)	ED (yrs)	BW (Kg)	A (days)	/ dun faire / dun a
3000 9 3.4E-04 1.4E-05 5.9E-07 1568 5.8 0.0105 4000 0.005 3.4E-04 1.4E-05 5.9E-07 1568 5.8 0.0105 4000 0.007 3.4E-04 1.4E-05 5.9E-07 1568 5.8 0.0105 5000 0.007 3.4E-04 1.4E-05 5.9E-07 1568 5.8 0.0105 5000 0.0007 3.4E-04 1.4E-05 5.9E-07 1568 5.8 0.0105 5000 0.0007 3.4E-04 1.4E-05 5.9E-07 1568 5.8 0.0105 5000 0.0007 3.4E-04 1.4E-05 5.9E-07 1568 5.8 0.0105 6000 0.0001 3.4E-04 1.4E-05 5.9E-07 1568 5.8 0.0105 4000 0.0002 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0105 4000 0.0002 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.01				Daily fR	Hourly IR	Event IR					
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100 100	Summer Foraging Initia	1		3.4E-04			1568	5.8	0.0105		
4000 0.002 3.4E-04 1.4E-05 5.9E-07 1568 5.8 0.0105 4000 0.002 3.4E-04 1.4E-05 5.9E-07 1568 5.8 0.0105 5000 0.0005 3.4E-04 1.4E-05 5.9E-07 1568 5.8 0.0105 5000 0.0002 3.4E-04 1.4E-05 5.9E-07 1568 5.8 0.0105 5000 0.0002 3.4E-04 1.4E-05 5.9E-07 1568 5.8 0.0105 (m) Distance TPA Concentration (g/m3) AE-04 1.4E-05 5.9E-07 1568 5.8 0.0105 (m) TPA Concentration (g/m3) Distance PE-07 TE-eventyr) EF eventyr) ED (yrs) BW (kg) (m) TPA Concentration (g/m3) AE-04 1.4E-05 5.9E-07 3136 5.8 0.0105 3000 0.005 3.4E-04 1.4E-05 5.9E-07 3136		200		3.4F-04			1568	5.8	0.0105		
4000 0.004 3.4E-04 1.4E-05 5.9E-07 1568 5.8 0.0105 5000 0.0005 3.4E-04 1.4E-05 5.9E-07 1568 5.8 0.0105 5000 0.0002 3.4E-04 1.4E-05 5.9E-07 1568 5.8 0.0105 5000 0.0002 3.4E-04 1.4E-05 5.9E-07 1568 5.8 0.0105 5000 0.0001 3.4E-04 1.4E-05 5.9E-07 1569 5.8 0.0105 Distance (m) TPA Concentration (g/m³) Intake Rate (m³/day) EF event /N EF event/yr BW (kg) 3000 0.005 3.4E-04 1.4E-05 5.9E-07 3.36 5.8 0.0105 4000 0.005 3.4E-04 1.4E-05 5.9E-07 3.36 5.8 0.0105 5000 0.0005 3.4E-04 1.4E-05 5.9E-07 3.36 5.8 0.0105 5000 0.0005 3.4E-04 1.4E-05 5.9E-07		4000		2 45 04			1568	5.8			
A000		4000		3.45-04				5.8		3650	
5000 0.0005 3.4E-04 1.4E-05 5.9E-07 1568 5.8 0.0105 5000 0.0001 3.4E-04 1.4E-05 5.9E-07 1568 5.8 0.0105 Distance (m) (m) TPA Concentration (g/m3) Intake Rate (m²/day) EF event/yr EF event/yr EF event/yr EF event/yr EF event/yr BW (kg) 3000 9 3.4E-04 1.4E-05 5.9E-07 3.136 5.8 0.0105 4000 0.005 3.4E-04 1.4E-05 5.9E-07 3.136 5.8 0.0105 500 0.0005 3.4E-04 1.4E-05 5.9E-07 3.136 5.8 0.0105 4000 0.005 3.4E-04 1.4E-05 5.9E-07 3.136 5.8 0.0105 500 0.0002 3.4E-04 1.4E-05 5.9E-07 3.136 5.8 0.0105 6000 0.0002 3.4E-04 1.4E-05 5.9E-07 3.136 5.8 0.0105 6000 <		4000		3.40-04				5.8			
5000 0.0002 3.4E-04 1.4E-05 5.9E-07 1.568 5.8 0.0105 6000 0.0001 3.4E-04 1.4E-05 5.9E-07 1.568 5.8 0.0105 Distance (m) TPA Concentration (g/m3) Intake Rate (m³/day) EF event/yr EF event/yr EF event/yr BW (kg) 3000 9 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0105 4000 0.005 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0105 4000 0.005 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0105 500 0.0002 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0105 500 0.0002 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0105 500 0.0002 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0105 6000 0.0002 3.4E-04 1.4E-05		2000		3.45-04				5.8			2.8E-08
Distance TPA Concentration (g/m3) Intake Rate (m³/day) EF eventlyr) ED (yrs) BW (kg)		2000		3.45-04			1569	8 4			1.4E-08
Distance		0009		3.4E-04	1		3	23			
Company Comp											
Distance (m) TPA Concentration (g/m3) Intake Rate (m²/day) EF eventyr) ED (yrs) BW (kg) 3000 9 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0105 4000 0.002 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0105 4000 0.002 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0105 500 0.002 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0105 500 0.001 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0105 500 0.0005 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0105 500 0.0005 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0105 500 0.0002 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0105 6000 0.0001 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0105 </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>											
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(m) TPA Concentration (g/m3) Intake Rate (m³/day) EF event/yr EP event		1			į						
3000 9 3.4E-04 1.4E-05 5.9E-07 3.136 5.8 4000 0.005 3.4E-04 1.4E-05 5.9E-07 3.136 5.8 4000 0.002 3.4E-04 1.4E-05 5.9E-07 3.136 5.8 4000 0.002 3.4E-04 1.4E-05 5.9E-07 3.136 5.8 5000 0.0005 3.4E-04 1.4E-05 5.9E-07 3.136 5.8 5000 0.0002 3.4E-04 1.4E-05 5.9E-07 3.136 5.8 6000 0.0001 3.4E-04 1.4E-05 5.9E-07 3.136 5.8 6000 0.0001 3.4E-04 1.4E-05 5.9E-07 3.136 5.8		(w)	TPA Concentration (g/m3)	_	itake Rate (m	/day)	EF eventfyr)	_	BW (kg)	AT (days)	Value (g/kg-day)
3000 9 3.4E.04 1.4E-05 5.9E-07 3136 5.8 4000 0.005 3.4E.04 1.4E-05 5.9E-07 3136 5.8 4000 0.002 3.4E.04 1.4E-05 5.9E-07 3136 5.8 4000 0.001 3.4E-04 1.4E-05 5.9E-07 3136 5.8 5000 0.0005 3.4E-04 1.4E-05 5.9E-07 3136 5.8 5000 0.0002 3.4E-04 1.4E-05 5.9E-07 3136 5.8 6000 0.0001 3.4E-04 1.4E-05 5.9E-07 3136 5.8				L	Hourly IR	Event IR					
3000 9 3.4E-04 1.4E-05 5.9E-07 3156 5.8 4000 0.005 3.4E-04 1.4E-05 5.9E-07 3136 5.8 4000 0.002 3.4E-04 1.4E-05 5.9E-07 3136 5.8 4000 0.001 3.4E-04 1.4E-05 5.9E-07 3136 5.8 500 0.0002 3.4E-04 1.4E-05 5.9E-07 3136 5.8 6000 0.0001 3.4E-04 1.4E-05 5.9E-07 3136 5.8 6000 0.0001 3.4E-04 1.4E-05 5.9E-07 3136 5.8	Maternity Cave Inhala	, i									255 03
0.005 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.002 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.001 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0005 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0007 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0001 3.4E-04 1.4E-05 5.9E-07 3136 5.8	matering out milan			3.4E-04						ļ	
0.002 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.001 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.002 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0002 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0001 3.4E-04 1.4E-05 5.9E-07 3136 5.8		Jook		3.4E-04	İ					3650	
0.0005 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0005 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0002 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0001 3.4E-04 1.4E-05 5.9E-07 3136 5.8		000		3.4E-04							
0.0005 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0002 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0001 3.4E-04 1.4E-05 5.9E-07 3136 5.8		200		3.4E-0							
0.0001 3.4E-04 1.4E-05 5.9E-07 3136 5.8 0.0001 3.4E-04 1.4E-05 5.9E-07 3136 5.8		100		3.4E-04							
0.0001 3.4E-04 1.4E-05 5.9E-07 3136 5.8		500		3.4F-0.							
		200		3.4E-0-						3650	0 2.8E-08
		3									
		1									

Attachment D: TPA Smoke Pots

Gray bat intake for TPA under Pasquill Category B.

PA Smoke Pots											
	Distance						Ш				Dally Chronic Intake
	(m)	TPA Concentra	Concentration (g/m3)	Ī	ntake Rate (m³/day)	day)	(event/yr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
				Daily IR	Hourly IR	Event IR					
ummer Foraging Inhalation	ation										
0	3000	6		3.4E-04	1.4E-05	5.9E-07	475	5.8	0.0105		3.8E-04
	4000	С	2	3.4E-04	1.4E-05	5.9E-07	475	5.8	0.0105		2.1E-07
	5000		2	3.4E-04	1.4E-05	5.9E-07	475	5.8	0.0105		8.5E-08
	2000		-	3.4E-04	1.4E-05	5.9E-07	475	5.8	0.0105		4.2E-08
	0005		35	3.4E-04	1.4E-05	5.9E-07	475	5.8	0.0105		
	0009		20	3.4E-04	L	5.9E-07	475	5.8	0.0105	3650	
	2002		1 5	3.4E-04	1.4E-05	5.9E-07	475	5.8	0.0105		4.2E-09
							ŀ				Daily Chronic Intake
	Distance (m)	TPA Concentr	Concentration (a/m3)		Intake Rate (m³/day)	(day)	(event/yr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
				Daily IR	Hourly IR	Event IR					
laternity Cave Inhalation	lo.										
	3000	6		3.4E-04	1.4E-05	5.9E-07	950	5.8			
	4000	0,005	35	3.4E-04	1.4E-05	5.9E-07	950	5.8			,
	5000		72	3.4E-04	1.4E-05	5.9E-07	950	5.8	0.0105		
	5000		-	3.4E-04	1.4E-05	5.9E-07	056	5.8			
	5000		05	3.4E-04	1.4E-05	5.9E-07	950	5.8			
	0009		02	3.4E-04	1.4E-05	5.9E-07	950	5.8			
	1000		5	3 AE 04	1 45.05	5 95-07	950	5.8	0.0105	3650	8.5E-09

Attachment D: Titanium Dioxide Grenades

Attachment D: Fog Oil - Static Smoke

Gray bat intake for titanium dioxide under Pasquill Category E.

	Distance	Concentration (a/m3)	Inta	Intake Rate (m³/day)	ay)	EF (eventlyr)	ED (yrs)	BW (kg)	AT (days)	Dally Chronic Intake Value (g/kg-day)
			Daily IR	Hourly IR	Event IR					
Summer Forgation Inhala	tion									
Supplied to the supplied to th		001	3.4E-04	1.4E-05	5.9E-07	24	5.8	0.0105	3650	
	000		3.4E-04	1.4E-05	5.9E-07	24	5.8	0.0105	3650	1.1E-08
And the second s	9		3.4F-04	1.4E-05	5.9E-07	24	5.8	0.0105	3650	
	000		3.45.04	1 4F-05	5.9E-07	-	5.8	0.0105	3650	2.1E-09
	3 6	;	3.46.04	1 4E-05	5 9F-07	24	5.8	0.0105	3650	
	0001		20 11 20	1 48-05	5 9F-07		5.8	0.0105	3650	4.3E-10
	1400	0,000	1	7 70 00	E OF 07		a u	0 0 0 0	3650	2.1E-10
	1800		3.4E-U4	T.4E-U2	3.3E-01		2		-	
A STATE OF THE PARTY OF THE PAR										
	1									Dally Chronic Intake
	Distance (m)	Concentration (g/m3)	<u>=</u>	Intake Rate (m³/day)	lay)	EF (event/yr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
			Dally IR	Hourly IR	Event IR					
Maternity Cave Inhalation	5									
	100	0.01	3.4E-04	1.4E-05	5.9E-07	48		0.0105		
	300		3.4E-04	1.4E-05	5.9E-07	7 48	5.8	0.0105		
	2005		3.4E-04	1.4E-05	5.9E-07	7 48	5.8	0.0105		
	002		3.4E-04	1.4E-05	5.9E-07	7 48	5.8	0.0105		
			3.4E-04	1.4E-05	5.9E-07	7 48	5.8	0.0105		
	1400		3.4E-04	ľ	5.9E-07	7 48	5.8	0.0105	3650	
The state of the s	1800		3.4E-04		5.9E-07	7 48	5.8	0.0105	3650	0 4.3E-10

and the commence of the commen

Attachment E Stressor Intake - Bald Eagle

INTAKE PARAMETERS FOR BALD EAGLES

Winter Inhalation

Parameter	Abbreviation	Definition
Distance		Number of meters from chemical source to exposure point.
Fog Oil Concentration		Exposure concentration.
Intake Rate		Amount of air inhaled.
Daily Intake Rate	Daily IR	Amount of air inhaled each day.
Hourly Intake Rate	Hourly IR	Amount of air inhaled each hour.
Event Intake Rate	Event IR	Amount of air inhaled during each chemical release.
Exposure Frequency	EF	Number of chemical exposures per year.
Exposure Duration	ED	Estimate of time receptor will potentially be exposed to chemical.
Body Weight	BW	Mass of adult receptor.
Averaging Time	AT	Lifespan of receptor.
Daily Chronic Intake Value		Amount of chemical stressor inhaled by receptor.

Winter Ingestion

Parameter	Abbreviation	Definition
Distance		Number of meters from chemical source to exposure point.
Fog Oil Deposition		Exposure concentration.
Prey Surface Area	Prey SA	Size of area of the body surface of prey that might be covered by fog oil particles.
Prey Weight		Mass of prey.
Concentration of Food Contaminant	CF	Quantity of contaminant deposited on food item.
Intake Rate		Amount of food ingested during each chemical release.
Exposure Frequency	EF	Number of chemical exposures per year.
Exposure Duration	ED	Estimate of time receptor will potentially be exposed to chemical.
Body Weight	BW	Mass of adult receptor.
Averaging Time	AT	Lifespan of receptor.
Daily Chronic Intake Value		Amount of chemical stressor ingested by receptor.

Winter Dermal Absorption

Parameter	Abbreviation	Definition
Distance		Number of meters from chemical source to exposure point.
Fog Oil Concentration		Exposure concentration.
Skin Surface Area		Surface area of receptor.
Absorption Factor	ABS	Degree of dermal absorption of stressor by receptor. Unitless - assumed to equal 1 (100% absorption).
Exposure Frequency	EF	Number of chemical exposures per year.
Exposure Duration	ED	Estimate of time receptor will potentially be exposed to chemical.
Body Weight	BW	Mass of adult receptor.
Averaging Time	AT	Lifespan of receptor.
Dermaily Absorbe Dose		Amount of chemical stressor dermally absorbed by receptor.

Summer Inhalation

Parameter	Abbreviation	Definition
Distance		Number of meters from chemical source to exposure point.
Fog Oil Concentration		Exposure concentration.
Intake Rate		Amount of air inhaled.
Daily Intake Rate	Daily IR	Amount of air inhaled each day.
Hourly Intake Rate	Hourly IR	Amount of air inhaled each hour.
Event Intake Rate	Event IR	Amount of air inhaled during each chemical release.
Exposure Frequency	EF	Number of chemical exposures per year.
Exposure Duration	ED	Estimate of time receptor will potentially be exposed to chemical.
Body Weight	BW	Mass of adult receptor.
Averaging Time	AT	Lifespan of receptor.
Daily Chronic Intake Value		Amount of chemical stressor inhaled by receptor.

Summer Dermal Absorption

Parameter	Abbreviation	Definition
Distance		Number of meters from chemical source to exposure point.
Fog Oil Concentration		Exposure concentration.
Skin Surface Area		Surface area of receptor.
Absorption Factor	ABS	Degree of dermal absorption of stressor by receptor. Unitless - assumed to equal 1 (100% absorption).
Exposure Frequency	EF	Number of chemical exposures per year.
Exposure Duration	ED	Estimate of time receptor will potentially be exposed to chemical.
Body Weight	BW	Mass of adult receptor.
Averaging Time	AT	Lifespan of receptor.
Dermally Absorbed Dose		Amount of chemical stressor dermally absorbed by receptor.

Attachment E: Fog Oil - Static Smoke

Bald eagle intake for fog oil under Pasquill Category E.

											Daily Chronic Intake
	Distance	Fog Oil Concentration	entration	100	Intake Rate (m³/day)	day)	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
				9	Ol wheel	Event IR			:		
				Daily In	DOGING IN						
mmer Inhalation								0, 00	7.6	40775	1 0F-07
1000	00000	50000	5	1.31	0.055	0.082		20.42			
South Nest	57707			10.4		0.082	7.1	20.42	4.5	12775	
Mid Nest	23638	0.0005	٥	5.1				07.00	4.5	12775	4.1E-08
North Nest	45057	0.0002	12	1.31	0.055	0.082	5	20.42			
							•				
	Distance	Fog Oil Concentration	centration 2,	of the second	Cities Area (m²)	ABS	EF (davs/vr)	ED (yrs)	BW (kg)	AT (days)	Dermally Absorbed Dose (g/kg-day)
	Œ	(m/g)		Shill Surface	,						
										_	
ummer Dermal Absorption	ption						i	20.40	4 5	12775	6.9E-07
South Nest	20229		5	0	0.275						
Mid Nest		0.001	Ξ	0.	0.275						
tseN drow		0.0005	92	0	0.275		1.7	20.42	T.		
CONTINUE											
			-								
			-								
							-			-	
			_								

Bald eagle intake for fog oil under Pasquill Category E.

Static Smoke											
	Distance (m)	Fog Oil Concentration (g/m³)	entration }		Intake Rate (m³/day)	day)	EF (davs/vr)	ED (vrs)	BW Item	AT (April	Daily Chronic Intake
				Daily IR	Hourly IR	Event IR		1	(Ru)	At (days)	value (g/kg-day)
Winter Inhalation			:								
	4000		1	1.31	0.055	0.082	7.1	14 58	3 7	40775	:
	5000		2	1.31	0.055			14 5R	2 4	-	
	9000	0.002	2	1.31	0.055		17	44 50	7		
	14000	0.001		1.31	0.055	0.082		000	C.4.		
	24000		5	131	2000	0.002		14.58	4.5	12775	
	20000		0	1.24	200	70.00		14.58	4.5	-	7.4E-08
	+00000+		-	200	0000	0.082			4.5		2.9E-08
				5	CCO.O	0.082	7.1	14.58	4.5	12775	1.5E-08
	Distance	Fog Oil Deposition	Prey SA	Prev Weight		intake Date					
	Œ	(g/m²)	(m ²)	(6)	CF (g/g)	(g/day)	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Daily Chronic Intake Value (g/kg-day)
Winter Ingestion											
	7500	10.01	0.0874	0.815	0.0011	292.5	7.4	14 60			
	10000	0.005	0.0874	0.815	0 0005	203 5		3 5	0.4	İ	5.6E-04
	18000	0.002	0.0874	0.815	0.0002	294 5		4.76	4.5		2.8E-04
	30000	0.001	0.0874	0.815	0000	205.5		2 2	6.4		1.1E-04
	20000		0.0874		0.0001	296.5		4.00	4.5		5.7E-05
	÷00009	0.0002	0.0874		0.000	297.5		2 2	4.0		2.9E-05
	20000++	0.0001	0.0874	0.815	0.0000	298.5	7.1	24.58	4.0	12//5	1.1E-05
	·							2	7		5.8E-06
The second secon											
	Distance	Fog Oil Concentration	utration								
	Œ	(g/m²)		Skin Surface Area (m²)	Area (m²)	ABS	EF (days/yr)	ED (yrs)	BW (kg)	AT (davs)	Desa (a/ka-day)
Winter Dermal Absorption	tion										(for Buch)
	7500	00		3750	y	ľ					
	10000	0.005	-	0.275	2 (0			14.58	4.5	12775	4.9E-06
	18000	0.002		0.27	9		7.1	14.58	4.5	12775	2.5E-06
	30000	0.001		0.275	5		7.4	14.30	4.5	12775	9.9E-07
	50000	0.0005	.5	0.275	5		7.1	14 58	4.0	12//2	4.9E-07
	÷00005	0.0002	;	0.275	5		7.1	14.58	0.4	3770	2.5E-07
	++00005	0.0001	_	0.275	5		7.1	14 58	2 4	2017	S.SE-US
									2	12/13	4.9E-08

Bald eagle intake for fog oil under Pasquill Category D.

Dally IR Hourty IR Event IR 131 0.055 0.082 7.1 20.42 4.5 12775 1.31 0.055 0.082 7.1 20.42 4.5 12775 1.31 0.055 0.082 7.1 20.42 4.5 12775 Intration Skin Surface Area (m²) ABS EF (days/yr) ED (yrs) BW (kg) AT (days) 5 0.275 1 7.1 20.42 4.5 12775 6 0.275 1 7.1 20.42 4.5 12775 2 0.275 1 7.1 20.42 4.5 12775 2 0.275 1 7.1 20.42 4.5 12775		Distance	Fog Oil Concentration	tion	Inta	Intake Rate (m³/dav)		EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Daily Chronic Intake Value (g/kg-day)
20229 0.0002 1.31 0.055 0.082 7.1 20.42 4.5 12775 23638 0.0001 1.31 0.055 0.082 7.1 20.42 4.5 12775 45057 0.0001 1.31 0.055 0.082 7.1 20.42 4.5 12775 45057 0.0002 1.31 0.055 0.082 7.1 20.42 4.5 12775 20229 0.0001 Skin Surface Area (m²) ABS EF (days/yr) ED (yrs) BW (kg) AT (days) 20229 0.0005 0.275 1 7.1 20.42 4.5 12775 45057 0.0002 0.275 1 7.1 20.42 4.5 12775 45057 1.2002		Ê		\dagger	Daily IR	Hourty IR	vent IR					
23639 0.0002 1.31 0.055 0.082 7.1 20.42 4.5 12775 45057 0 0.085 0.082 7.1 20.42 4.5 12775 45057 0 0.0001 1.31 0.055 0.082 7.1 20.42 4.5 12775 45057 0 0.0001 0.055 0.082 7.1 20.42 4.5 12775 20229 0.001 Concentration (glm²) Skin Surface Area (m²) ABS EF (days/yr) ED (yrs) BW (kg) AT (days) 20229 0.0001 0.275 1 7.1 20.42 4.5 12775 20229 0.0002 0.275 1 7.1 20.42 4.5 12775 45057 0.0002 0.275 1 7.1 20.42 4.5 12775				+	Camp							
20229 0.0002 1.31 0.055 0.082 7.1 2.042 4.5 12775 22638 0.0001 1.31 0.056 0.082 7.1 2.042 4.5 12775 49657 0 0.0001 1.31 0.056 0.082 7.1 2.042 4.5 12775 ance Fog Oil Concentration Skin Surface Area (m²) ABS EF (days/yr) ED (yrs) BW (kg) AT (days) 22229 0.0001 0.275 1 7.1 2.042 4.5 12775 22229 0.0005 0.275 1 7.1 2.042 4.5 12775 45057 0.0002 0.275 1 7.1 2.042 4.5 12775 45057 0.0002 0.275 1 7.1 2.042 4.5 12775	nmer Inhalation								20.42	4.5		4.1E-08
28536 0.0001 1.31 0.055 0.082 7.1 20.42 4.5 12775 45057 0 0 1.31 0.055 0.082 7.1 20.42 4.5 12775 45057 0 0.0002 0.275 1 7.1 20.42 4.5 12775 20229 0.0001 0.275 1 7.1 20.42 4.5 12775 20338 0.0005 0.275 1 7.1 20.42 4.5 12775 45057 0.0002 0.275 1 7.1 20.42 4.5 12775 45057 0.0002 0.275 1 7.1 20.42 4.5 12775	Courth Mach			_	1.31	0.055			40.75			
45057 0 0 131 0.055 0.082 7.1 20.42 4.5 12775 45057 0 0 131 0.055 0.082 7.1 20.42 4.5 12775 45057 0.0002 0.275 1 7.1 20.42 4.5 12775 45057 0.0002 0.275 1 7.1 20.42 4.5 12775 45057 0.0002 0.275 1 7.1 20.42 4.5 12775 45057 0.0002 0.275 1 7.1 20.42 4.5 12775	South Mass				131	0.055			20.42	,		
45057 0 1.31 0.000	Mid Nest					9000			20 42	4.5		0.0E+00
ance Fog Oil Concentration (g/m²) Skin Surface Area (m²) ABS EF (days/yr) ED (yrs) BW (kg) AT (days) 20229 0.001 0.275 1 7.1 20.42 4.5 12775 23838 0.0002 0.275 1 7.1 20.42 4.5 12775 45057 0.0002 0.275 1 7.1 20.42 4.5 12775	North Nest		0	1	1.31	cco.o						
ance Fog Oil Concentration (g/m²) Skin Surface Area (m²) ABS EF (daystyr) ED (yrs) BW (kg) AT (days) 20229 0.001 0.275 1 7.1 20.42 4.5 12775 22538 0.0002 0.275 1 7.1 20.42 4.5 12775 45057 0.0002 0.275 1 7.1 20.42 4.5 12775												
ance Fog Oil Concentration Skin Surface Area (m²) ABS EF (days/yr) ED (yrs) BW (kg) AT (days) 20229 0.0001 0.275 1 7.1 20.42 4.5 12775 23638 0.0005 0.275 1 7.1 20.42 4.5 12775 45057 0.0002 0.275 1 7.1 20.42 4.5 12775			_									
ance Fog Oil Concentration (g/m²) Skin Surface Area (m²) ABS EF (days/yr) ED (yrs) BW (kg) AT (days) (g/m²) Skin Surface Area (m²) ABS EF (days/yr) ED (yrs) BW (kg) AT (days) 20229 0.007 0.275 1 7.1 20.42 4.5 12775 23638 0.0005 0.275 1 7.1 20.42 4.5 12775 45057 1 7.1 20.42 4.5 12775 45057 1 7.1 20.42 4.5 12775												
ance Fog Oil Concentration Skin Surface Area (m²) ABS EF (daystyr) ED (yrs) BW (kg) AT (days) (g/m²) Skin Surface Area (m²) ABS EF (daystyr) ED (yrs) BW (kg) AT (days) 20229 0.001 0.275 1 7.1 20.42 4.5 12775 20229 0.0005 0.275 1 7.1 20.42 4.5 12775 45657 0.0002 0.275 1 7.1 20.42 4.5 12775				+								
m) Fog Oil Concentration Skin Surface Area (m²) ABS EF (days/yr) ED (yrs) BW (kg) AT (days) 20229 0.001 0.275 1 7.1 20.42 4.5 12775 20329 0.0005 0.275 1 7.1 20.42 4.5 12775 45057 0.0002 0.275 1 7.1 20.42 4.5 12775 45057 0.0002 0.275 1 7.1 20.42 4.5 12775				1								
(g/m²) (g/m²) Skin Surface Area (m²) ABS EF (days/yr) EU (yrs) DV (vg) CT (vg)			Fog Oil Concentr	ation		•		,		100	AT (daye)	Dermally Absorbed
20229 0.001 0.275 1 7.1 20.42 4.5 23838 0.0005 0.275 1 7.1 20.42 4.5 45057 0.0002 0.275 1 7.1 20.42 4.5			(g/m²)		Skin Surfac	e Area (m²)	ABS	EF (days/yr)	L	(Fu) Ma	(c(m))	
20229 0.001 0.275 1 7.1 20.42 4.5 20329 0.0005 0.275 1 7.1 20.42 4.5 45057 0.0002 0.275 1 7.1 20.42 4.5												
20229 0.001 0.275 1 7.1 20.42 4.5 23638 0.0005 0.275 1 7.1 20.42 4.5 45057 0.0002 0.275 1 7.1 20.42 4.5	nmer Dermai Absor	ption					j		! 			
23638 0.0005 0.275 1 7.1 20.42 4.5 45057 0.0002 0.275 1 7.1 20.42 4.5	South Nest				0	7.5		31;				3.5F-07
45057 0,0002 0,275 1 7.1 20.42 4.5	Mid Nec				0.2	5/						
	Sold drold				0.2	:75	-	7.1				
	POLITICAL TO THE POLITICAL THE POLITICAL TO THE POLITICAL TO THE POLITICAL TO THE POLITICAL TO THE POLITICAL TO THE POLITICAL TO THE POLITICAL TO THE POLITICAL TO THE POLITICAL TO THE POLITICAL TO THE POLITICAL TO THE POLITICAL TO THE POLITICAL TO THE POLITICAL TO THE POLITICAL TO THE POLITICAL TO THE POLITICAL TO THE POLITICAL TO THE POLITICAL THE POLITICAL TO THE POLITICAL TO THE POLITICAL TO THE POLITICAL THE POLITICAL TO THE POLITICAL TO THE POLITICAL TO THE POLITICAL TO THE POLITICAL TO THE POLITICAL TO THE POLITICAL TO THE POLITICAL TO THE POLITICAL TO THE POLITICAL TO THE POLITICAL TO THE POLITICAL TO THE POLITICAL TO THE POLITICAL TO THE POLITICAL TO TH								1 1		-	
				:	:						-	

Bald eagle intake for fog oil under Pasquill Category D.

Winter Inhalation	Distance	1									
Inter Inhalation	(m)	Fog Oil Concentration (g/m³)	entration	Inta	Intake Rate (m³/dav)	(dav)	FE (davelur)	(m)			<u> </u>
inter Inhalation				41.11.00		1	L (daysiyi)	ED (yrs)	ъw (кg)	AT (days)	Value (g/kg-day)
				Ť	TI NOUN	Event IR					
	3500	100		1 24	1100						
	4500	200		10.1	CCO			14.58	4.5	12775	1.5F-06
	009	200.0		1.31	0.055			14.58	4.5		
	200	0.002		1.31	0.055		7.1	14.58	4.5		
	9200	1000		1.31	0.055		7.1	14.58	45		
	00621	0.0005	2	1.31	0.055	0.082		14.58	4.5		
	22500	0.0002	2	1.31	0.055			14 58			
	35500	0.0001	_	1.31	0.055		7.1	14.58	4.0	12//5	2
									Q.		1.5E-08
	$\Big]$	Foo Oil									
	Distance (m)	Deposition (g/m²)	Prey SA (m²)	Prey Weight	CF (a/a)	Intake Rate	E (Asympton	1			Daily Chronic Intake
					(6.6)	(Sund)	L. (daysiyi)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
Winter Ingestion											
	9200	0.01	0.0874	0.815	0.0011	292.5	7.1	14.58			
	8500	0.005	0.0874	0.815	0.0005	293.5		14 58	2.4	12772	
	14000	0.002	0.0874	0.815	0.0002	294.5		14.58	5,4		
	22000	0.001	0.0874	0.815	0.0001	295.5		14.58	7 7		
	32500	0.0005	0.0874	0.815	0.0001	296.5		14.58	2.4		3./E-U3
	+00000	0.0002	0.0874	0.815	0.0000	297.5		14.58	45		
	++000005	0.0001	0.0874	0.815	0.000	298.5		14.58	4.5		
											9.9E-00
	Distance	Fog Oil Concentration	ntration								
	Ē	(g/m²)		Skin Surface Area (m²)	Area (m²)	ABS	EF (days/yr)	ED (yrs)	BW (kg)	AT (davs)	Dose (n/kn-dav)
Winter Dermal Absorption											
	6500	0.01		72.0	U						
	1	0.005		720			17	14.58	4.5	12775	
	14000	0.002	:	0.275				14.58	4.5	12775	2.5E-06
	22000	0.001		0.275		- -	1.7	14.58	4.5	12775	
	35500	0.0005		0.275	2	-	7	14.58	4.5	12775	4.9E-07
	±00005	0.0002		0.275	15	-	7.4	44.50	U.4.	12//5	2.5E-07
	++00005	0.0001		0 275		-		14.30	4.5	12775	9.9E-08
							5)	14.58	4.5	12775	4.9E-08

Bald eagle intake for fog oil under Pasquill Category C.

tance Fog Oil Concentration Intake Rate (m³/day)												Daily Chronic Intake
1		Distance	Fog Oil Conce	ntration	Int	ake Rate (m³/	day)	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
20229 0 131 0.055 0.082 7.1 20.42 4.5 12775 0 29638 0 1.31 0.055 0.082 7.1 20.42 4.5 12775 0 45057 0 0 1.31 0.055 0.082 7.1 20.42 4.5 12775 0 45067 0 1.31 0.055 0.082 7.1 20.42 4.5 12775 0 stance Fog Oil Concentration Skin Surface Area (m²) ABS EF (days/ryr) ED (yrs) BW (kg) AT (days) Dose (g/kg) (m) (g/m²) Skin Surface Area (m²) ABS EF (days/ryr) ED (yrs) BW (kg) AT (days) Dose (g/kg) 20229 0.0002 0.275 1 7.1 20.42 4.5 12775 1 45057 0 0.275 1 1 7.1 20.42 4.5 12775 1 45072 0 0 0.275					г	Hourly IR						
20229 0 131 0.055 0.082 7.1 20.42 4.5 12775 0 45057 0 131 0.056 0.082 7.1 20.42 4.5 12775 0 45057 0 131 0.056 0.082 7.1 20.42 4.5 12775 0 stance Fog Oil Concentration Skin Surface Area (m³) ABS EF (dayslyr) ED (yrs) BW (kg) AT (days) Does (g/kg) 20229 0.0002 0.275 1 7.1 20.42 4.5 12775 45057 0 0.275 1 7.1 20.42 4.5 12775 45057 0 0.275 1 7.1 20.42 4.5 12775					Т							
20229 0 131 0.055 0.082 7.1 20.42 4.5 12775 0 45057 0 131 0.055 0.082 7.1 20.42 4.5 12775 0 45067 0 131 0.055 0.082 7.1 20.42 4.5 12775 0 stance Fog Oil Concentration Skin Surface Area (m²) ABS EF (days/ryr) ED (yrs) BW (kg) AT (days) Doese (g/kg) (m) (g/m²) Skin Surface Area (m²) ABS EF (days/ryr) ED (yrs) BW (kg) AT (days) Doese (g/kg) 20229 0.0002 0.275 1 7.1 20.42 4.5 12775 45057 0 0.0002 0.275 1 7.1 20.42 4.5 12775 45057 0 0.275 1 7.1 20.42 4.5 12775	amer Inhalation								20.40	4.5		
Standard Continue					1.31	0.055			24.02	7	1	
25638 0	South Nest					2000			20.42	4.5		
45057 0 1 131 0.055 0.082 7.1 2.042 stance Fog Oil Concentration (m) 4BS EF (dayslyr) ED (yrs) BW (kg) AT (days) Dose (g/kg) 20229 0.0002 0.275 1 7.1 20.42 4.5 12775 45057 0 0.275 1 7.1 20.42 4.5 12775 45057 0 0.275 1 7.1 20.42 4.5 12775	Mid Nest		-		1.31	0.000			4	4.5		
stance Fog Oil Concentration (g/m²) Skin Surface Area (m³) ABS EF (dayslyr) ED (yrs) BW (kg) AT (days) Dose (g/kg) 20229 0.0002 0.275 1 7.1 20.42 4.5 12775 2.3938 0.0002 0.275 1 7.1 20.42 4.5 12775 4.5057 0 0.275 1 7.1 20.42 4.5 12775 1 7.1 2	10014 41 414		c		1.31	0.055			75.07	2		
tance Fog Oil Concentration (g/m²) Skin Surface Area (m²) ABS EF (days/yr) ED (yrs) BW (kg) AT (days) Dose (g/kg) (m²) AT (days) Dose (g/kg) Dose (g/kg) AT (days) Dose (g/kg) Dose (g	SAN ULION											
tance Fog Oil Concentration (m) (g/m³) Skin Surface Area (m³) ABS EF (days/yr) ED (yrs) BW (kg) AT (days) Dose (g/kg) (m) Dose (g/kg) (g/m³) AT (days) Dose (g/kg) Dose (g/kg)												
tance Fog Oil Concentration Skin Surface Area (m²) ABS EF (days/yr) ED (yrs) BW (kg) AT (days) Dose (g/kg) (m) AT (days) Dose (g/kg) Dose (g/kg) AT (days) Dose (g/kg) Dose (g/kg) AT (days) Dose (g/kg) Dose												
tance Fog Oil Concentration Skin Surface Area (m²) ABS EF (days/yr) ED (yrs) BW (kg) AT (days) Dose (g/kg) (m) AT (days) Dose (g/kg) AT (days) Dose (g/kg) AT (days) Dose (g/kg) AT (days) Dose (g/kg) AT (days) Dose (g/kg) AT (days) Dose (g/kg) AT (days) AT (days) Dose (g/kg) AT (days) AT (days) Dose (g/kg) AT (days) AT (days) Dose (g/kg) AT (days) AT (days) Dose (g/kg) AT (days) AT (days) Dose (g/kg) AT (days) AT (days) AT (days) Dose (g/kg) AT (days) AT (days) Dose (g/kg) Dose (g/kg)												
stance (m) Fog Oil Concentration (g/m²) Skin Surface Area (m²) ABS EF (dayslyr) ED (yrs) BW (kg) AT (days) Dose (g/kg) 20229 0.0002 0.275 1 7.1 20.42 4.5 12775 28538 0.0002 0.275 1 7.1 20.42 4.5 12775 45077 0 0.275 1 7.1 20.42 4.5 12775 45077 0 0.275 1 7.1 20.42 4.5 12775												
stance (m) Fog Oil Concentration (g/m²) Skin Surface Area (m²) ABS EF (days/yr) ED (yrs) BW (kg) AT (days) Dose (g/kg) 20229 0.0002 0.275 1 7.1 20.42 4.5 12775 23638 0.0002 0.275 1 7.1 20.42 4.5 12775 45077 0 0.275 1 7.1 20.42 4.5 12775												
(m) (g/m²) Skin Surface Area (m²) ABS EF (days/yr) EU (yrs) Dav (rsg) Ar (usps) Coordinates (m²) ABS (EF (days/yr) EU (yrs) Dav (rsg) Ar (usps) Coordinates (m²) ABS (EF (days/yr) EU (yrs) Dav (rsg) Ar (usps) Coordinates (m²) ABS (Gays/yr) A		Dietance	Fog Oil Conc	entration						170	AT (daye)	
20229 0.0002 0.275 1 7.1 20.42 4.5 12775 23638 0.0002 0.275 1 7.1 20.42 4.5 12775 45057 0 0.275 1 7.1 20.42 4.5 12775		(E)	m/a)		Skin Surfac	e Area (m²)	ABS	EF (days/yr)		(Su) MO	C (mm)	_L
20229 0.0002 0.275 1 7.1 20.42 4.5 12775 23638 0.0002 0.275 1 7.1 20.42 4.5 12775 45057 0 0.275 1 7.1 20.42 4.5 12775												
20229 0.0002 0.275 1 7.1 20.42 4.5 12775 23638 0.0002 0.275 1 7.1 20.42 4.5 12775 45057 0 0.275 1 7.1 20.42 4.5 12775												
20229 0.0002 0.275 1 7.1 20.42 4.5 12775 23638 0.0002 0.275 1 7.1 20.42 4.5 12775 45067 0 0.275 1 7.1 20.42 4.5 12775	mmer Dermal Absor	rption						7.1				
23638 0.0002 0.275 1 7.1 20.42 4.5 12775 45057 0 0.275 1 7.1 20.42 4.5 12775	South Nes			2	·	6/2		1				
45067 0 0275	Mid Nes			2	o'.	6/2						
	North Nes		0		0	275			25.00			
		-				L						

Pasquill Category C

Bald eagle intake for fog oil under Pasquill Category C.

Positrone Posi								-				
Secondaria		Distance (m)	Fog Oil Conc (g/m	sentration	<u> </u>	ake Rate (m³/	(dav)	E (42)				
3500 0.01 1.31 0.055 0.002 7.1 14.58 4.5 12775 4000 0.002 1.31 0.055 0.082 7.1 14.58 4.5 12775 5500 0.0000 1.31 0.055 0.082 7.1 14.58 4.5 12775 1500 0.0000 1.31 0.055 0.082 7.1 14.58 4.5 12775 1500 0.0000 1.31 0.055 0.082 7.1 14.58 4.5 12775 16500 0.0000 1.31 0.055 0.082 7.1 14.58 4.5 12775 16500 0.0001 1.31 0.055 0.082 7.1 14.58 4.5 12775 16500 0.001					Daily IR	Hourly IR	Event IR	(day siyt)	_L	BW (kg)	AT (days)	_L
Second Continue	ricer innalation											
1200 0.005 1.31 0.055 0.082 7.1 14.58 4.5 127.75 1200 0.0002 1.31 0.055 0.002 7.1 14.58 4.5 127.75 1200 0.0002 1.31 0.055 0.002 7.1 14.58 4.5 127.75 1200 0.0007 1.31 0.055 0.002 7.1 14.58 4.5 127.75 1200 0.0007 1.31 0.055 0.002 7.1 14.58 4.5 127.75 1200 0.0007 0.0007 0.0007 0.0007 0.0007 0.0007 0.0007 1200 0.0007 0.0007 0.0007 0.0007 0.0007 0.0007 1200 0.0007 0.0007 0.0007 0.0007 0.0007 0.0007 1200 0.0007 0.0007 0.0007 0.0007 0.0007 0.0007 1200 0.0007 0.0007 0.0007 0.0007 0.0007 0.0007 1200 0.0007 0.0007 0.0007 0.0007 0.0007 0.0007 1200 0.0007 0.0007 0.0007 0.0007 0.0007 0.0007 1200 0.0007 0.0007 0.0007 0.0007 0.0007 0.0007 1200 0.0007 0.0007 0.0007 0.0007 0.0007 0.0007 1200 0.0007 0.0007 0.0007 0.0007 0.0007 0.0007 1200 0.0007 0.0007 0.0007 0.0007 0.0007 0.0007 1200 0.0007 0.0007 0.0007 0.0007 0.0007 0.0007 1200 0.0007 0.0007 0.0007 0.0007 0.0007 0.0007 1200 0.0007 0.0007 0.0007 0.0007 0.0007 0.0007 1200 0.0007 0.0007 0.0007 0.0007 0.0007 0.0007 1200 0.0007 0.0007 0.0007 0.0007 0.0007 0.0007 1200 0.0007 0.000		3200			1.31	0.055			14 58	3.4	1	
Secondaries Continue Contin		3200		2	1.31	0.055			14.60	7		
12000 0.0001 1.31 0.055 0.002 7.1 14.38 4.5 12775 12775 14.58 0.0002 1.3775 14.58 0.0002 1.3775 14.58 4.5 12775 12775 14.58 4.5 12775 12775 14.58 4.5 12775 12775 14.58 4.5 1277		4000		2	1.31	0.055			2.30	4.5		
12000 0.00005 1.31 0.0565 0.0002 7.1 14.58 4.5 12775 1.2000 0.00002 1.31 0.0565 0.0002 7.1 14.58 4.5 12775 1.2000 0.0001 0.		9200		-	131	0.055			14.58	4.5		
1200		7500		i.	7	0000			14.58	4.5		
Feg Oil Concentration Co		12000		, ,	15.	0.055			14.58	4.5		
Total Composition 131 0.055 0.002 7.1 14.59 4.5 12775 14.59 14.50 12775 14.50	,	18600		7	1.31	0.055			14.58	4.5	ĺ	
Peg Oil Prey SA Prey Weight Prey SA Prey Meight Prey SA Prey Weight Prey SA Prey		00001			1.31	0.055			14 SR	2.4		
Fog Oil Prey SA Prey Weight Fog Oil Prey SA Prey Weight Fog Oil Cream Fog Oil Crea									r r	3.4		
Second Continue												
Colored Colo			Food	1								
3500 0.001 0.0674 0.815 0.0001 222.5 7.1 14.58 4.5 12775 14.58 0.0002 0.0005 0.0004 0.0015 0.0002 0.0005 0.0004 0.0015 0.0001		Distance (m)	Deposition (g/m²)		Prey Weight	(2)0/9/	Intake Rate					
3500 0.01 0.0874 0.815 0.0011 292.5 7.1 14.58 4.5 12775 4000 0.002 0.0874 0.815 0.0001 293.5 7.1 14.58 4.5 12775 5500 0.002 0.0874 0.815 0.0001 294.5 7.1 14.58 4.5 12775 4000 0.000 0.0874 0.815 0.0001 296.5 7.1 14.58 4.5 12775 24000 0.0001 0.0874 0.815 0.0000 296.5 7.1 14.56 4.5 12775 40000 0.0001 0.0874 0.815 0.0000 296.5 7.1 14.56 4.5 12775 40000 0.0001 0.0874 0.0000 296.5 7.1 14.56 4.5 12775 40000 0.0002 0.0000 2.0000 2.0000 2.0000 2.0000 2.0000 2.0000 2.0000 2.0000 2.0000 2.0000 2.0000 </td <td></td> <td></td> <td></td> <td> </td> <td></td> <td>RA S</td> <td>(g/day)</td> <td>Er (days/yr)</td> <td>ED (yrs)</td> <td>BW (kg)</td> <td>AT (days)</td> <td></td>						RA S	(g/day)	Er (days/yr)	ED (yrs)	BW (kg)	AT (days)	
3500 0.001 0.0874 0.815 0.0011 229.5 7.1 14.56 4.5 12775 5500 0.005 0.0874 0.815 0.0002 224.5 7.1 14.56 4.5 12775 5500 0.005 0.0874 0.815 0.0002 224.5 7.1 14.56 4.5 12775 5400 0.0001 0.0874 0.815 0.0000 229.5 7.1 14.56 4.5 12775 5400 0.0001 0.0874 0.815 0.0000 229.5 7.1 14.56 4.5 12775 5400 0.0001 0.0874 0.815 0.0000 229.5 7.1 14.56 4.5 12775 5400 0.0001 0.0874 0.815 0.0000 229.5 7.1 14.56 4.5 12775 5400 0.0002 0.0275 1 7.1 14.56 4.5 12775 5400 0.0002 0.0275 1 7.1 14.56 4.5 12775 5400 0.0002 0.0275 1 7.1 14.56 4.5 12775 5400 0.0000 0.0001 0.0275 1 7.1 14.56 4.5 12775 5400 0.0000 0.0001 0.0000 0.0000 5400 0.0001 0.0001 0.0000 5400 0.0000 0.0000 0.0000 5400 0.0001 0.0001 0.0000 5400 0.0001 0.0001 0.0001 5400 0.0000 0.0000 0.0000 5400 0.0000 0.0000 0.0000 5400 0.0000 0.0000 5400 0.0000 0.0000 5400 0.0000 0.0000 5400 0.0000 0.0000 5400 0.0000 0.0000 5400 0.0000 0.0000 5400 0.0000 0.0000 5400 0.0000 0.0000 5400 0.0000 0.0000 5400 0.0000 0.0000 5400 0.0000 0.0000 5400 0.0000 0.0000 5400 0.0000 0.0000 5400 0.0000 0.0000 5400 0.0000 0.0000 5400 0.0000	ter Ingestion											
4000 0.0056 0.0874 0.615 0.0005 284.5 7.1 14.58 4.5 12775 8500 0.0002 0.0874 0.615 0.0001 284.5 7.1 14.58 4.5 12775 8000 0.0001 0.0874 0.615 0.0001 286.5 7.1 14.58 4.5 12775 24000 0.0001 0.0874 0.615 0.0001 286.5 7.1 14.58 4.5 12775 40000 0.0001 0.0874 0.615 0.0000 286.5 7.1 14.58 4.5 12775 40000 0.0001 0.0874 0.615 0.0000 286.5 7.1 14.58 4.5 12775 11 1.0000 0.0001 0.0001 286.5 7.1 14.58 4.5 12775 1.0000 0.0001 0.0001 0.0001 2.0000 2.0000 2.0000 2.0000 2.0000 2.0000 2.0000 2.0000 2.0000 2.00	** ** *********************************	3500		0.0874	0.815	0.0011	292 5		05.77			
\$500 0.002 0.0815 0.0002 284.5 7.1 14.56 4.5 12775 12000 0.0001 0.0874 0.815 0.0001 286.5 7.1 14.56 4.5 12775 24000 0.0002 0.0874 0.815 0.0001 286.5 7.1 14.56 4.5 12775 4000 0.0001 0.0874 0.815 0.0000 289.5 7.1 14.56 4.5 12775 4000 0.0001 0.0874 0.815 0.0000 289.5 7.1 14.56 4.5 12775 18tance Fog Oil Concentration 1.0874 1.088 EF (dayskyr) ED (yrs) BW (kg) AT (days) Dose (gikg 1mm (gm²) Skin Surface Area (m²) ABS EF (dayskyr) ED (yrs) BW (kg) AT (days) Dose (gikg 3500 0.01 0.0275 1 7.1 14.58 4.5 12775 4000 0.0002 0.0275 1 7		4000		0.0874	0.815	0.0005	293.5		00.7			
1200		2200		0.0874	0.815	0.0002	294 5		2 2	6.4	-	
1200		8000		0.0874	0.815	0.0001	295.5		4.30	4.5		
Skin Surface Area (m²) ABS EF (days/yr) 14.58 4.5 12775 12000 0.0002 0.0074 0.0175 14.58 4.5 12775 14.58 4.5 12775 12000 0.0002		12000		0.0874	0.815	0.0001	296.5		200	4.5		
4000 0.0001 0.0874 0.815 0.0000 298.5 7.1 14.56 4.5 12775 12775 14.56 12775		24000		0.0874	0.815	0.0000	297.5		0 4	. 4	į	
Skin Surface Area (m²) ABS EF (days/yr) ED (yrs) BW (kg) AT (days) Dose (g/kg-fr/grade) AT (days) Dose (g/kg-fr/grade) AT (days) Dose (g/kg-fr/grade) AT (days) Dose (g/kg-fr/grade) AT (days) AT (days) Dose (g/kg-fr/grade) AT (days) AT (days) Dose (g/kg-fr/grade) AT (days) AT (days) Dose (g/kg-fr/grade) AT (days) AT (days) AT (days) Dose (g/kg-fr/grade) AT (days) AT (d		40000		0.0874	0.815	0.0000	298 F	-	90.7	4.5		
Skin Surface Area (m²) ABS EF (dayskyr) ED (yrs) BW (kg) AT (days) Dermaily At a condition Conditi							2003		14.58	4.5		
Skin Surface Area (m²) ABS EF (days/yr) ED (yrs) BW (kg) AT (days) Demaily At a condition Conditio												
(m) (g/m²) Skin Surface Area (m³) ABS EF (days/yr) ED (yrs) BW (kg) AT (days) Demaily All Demails All Dose (g/kg) 3500 0.01 0.275 1 7.1 14.58 4.5 12775 4000 0.005 0.275 1 7.1 14.58 4.5 12775 8000 0.0005 0.275 1 7.1 14.58 4.5 12775 12000 0.0005 0.275 1 7.1 14.58 4.5 12775 24000 0.0005 0.275 1 7.1 14.58 4.5 12775 40000 0.0001 0.275 1 7.1 14.58 4.5 12775 40000 0.0001 0.275 1 7.1 14.58 4.5 12775 40000 0.0001 0.0002 0.275 1 7.1 14.58 4.5 12775		Distance	Fog Oil Conce	ntration								
3500 0.01 0.275 1 7.1 14.58 4.5 12775 4000 0.005 0.275 1 7.1 14.58 4.5 12775 5500 0.002 0.275 1 7.1 14.58 4.5 12775 8000 0.001 0.275 1 7.1 14.58 4.5 12775 12000 0.0005 0.275 1 7.1 14.58 4.5 12775 24000 0.0002 0.275 1 7.1 14.58 4.5 12775 4000 0.0001 0.275 1 7.1 14.58 4.5 12775 4000 0.0001 0.275 1 7.1 14.58 4.5 12775 4000 0.0001 0.275 1 7.1 14.58 4.5 12775		(m)	(g/m²)		Skin Surface	Area (m²)	ABS	EE (days has	2			Dermally Absorbed
3500 0.01 0.275 1 7.1 14.58 4.5 12775 4000 0.005 0.275 1 7.1 14.58 4.5 12775 5500 0.002 0.275 1 7.1 14.58 4.5 12775 8000 0.001 0.275 1 7.1 14.58 4.5 12775 24000 0.0002 0.275 1 7.1 14.58 4.5 12775 40000 0.0001 0.275 1 7.1 14.58 4.5 12775 4000 0.0001 0.275 1 7.1 14.58 4.5 12775	ler Dermal Absorr	- diga						L (uays/yr)	ED (yrs)	BW (kg)	AT (days)	Dose (g/kg-day)
0.005 0.275 1 7.1 14.58 4.5 12775 0.005 0.275 1 7.1 14.58 4.5 12775 0.007 0.2075 1 7.1 14.58 4.5 12775 0.0005 0.275 1 7.1 14.58 4.5 12775 0.0007 0.275 1 7.1 14.58 4.5 12775 0.0007 0.275 1 7.1 14.58 4.5 12775 0.0007 0.275 1 7.1 14.58 4.5 12775 1 7.1 14.56 4.5 12775		1										
0.002 0.275 1 7.1 14.58 4.5 12775 0.001 0.275 1 7.1 14.58 4.5 12775 0.0005 0.275 1 7.1 14.58 4.5 12775 0.0002 0.275 1 7.1 14.58 4.5 12775 0.0001 0.275 1 7.1 14.58 4.5 12775 1 7.1 14.58 4.5 12775		4000	10.0	-	0.275		-	7.1	14.58	4.5	12775	4 05 00
0.002 0.275 1 7.1 14.58 4.5 127.5 0.0005 0.275 1 7.1 14.58 4.5 12775 0.0005 0.275 1 7.1 14.58 4.5 12775 0.0002 0.276 1 7.1 14.58 4.5 12775 0.0001 0.275 1 7.1 14.58 4.5 12775 1 7.1 14.58 4.5 12775		200	0.00	+	0.275		-	7.1	14.58	4.5	42775	4.85-0
0.0005 0.275 1 7.1 14.58 4.5 12775 0.0005 0.275 1 7.1 14.58 4.5 12775 0.0002 0.275 1 7.1 14.58 4.5 12775 0.0007 0.275 1 7.1 14.58 4.5 12775 1 7.1 14.58 4.5 12775		0000	0.002		0.275		1	7.1	14.58	4.5	12775	2.55-06
U00002 0.275 1 7.1 14.58 4.5 12775 0.0001 0.275 1 7.1 14.58 4.5 12775 1 7.1 14.58 4.5 12775		12000	1000		0.275		1	7.1	14.58	45	19775	9.95-07
0.0001 0.275 1 7.1 14.58 4.5 12775 1 7.1 14.58 4.5 12775		2400	0.000		0.275		1	7.1	14.58	4.5	12775	4.9F-U/
0.0001 0.275 1 7.1 14.58 4.5 12775		0000	0.0002		0.276		1	7.1	14.58	4.5	12775	Z.3E-U/
		2000	1000.0	-	0.275		-	7.1	14.58	45	42775	מיאברים
				+	+							4.95-08
					+							
						+						

Attachment E: Fog Oil - Mobile Smoke

Bald eagle intake for fog oil under Pasquill Category B.

		Fog Oil Concentration	tration					***************************************	-		_
	Uistance (m)	(₂ m/6)		int.	Intake Rate (m³/day)	day)	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
				Daily IR	Hourly IR	Event IR					
Cummer Inhalation											
Paris North	00000	0		1.31	0.055	0.082	7.1	20.42	4.5		
South Mear				1 34		0.082	7.1	20.42	4.5	12775	0.0E+00
Mid Nes	23638	0		10.1					14	12775	0.0F+00
North Nest	45057	0		1.31	0.055	0.082	5	20.42	2.5		
										_	
<u> </u>	Distance	Fog Oil Concentration	ntration		•		; ;		100	AT (daile)	Deemally Absorbed
	Ē	(g/m²)		Skin Surfac	Skin Surface Area (m*)	ABS	EF (days/yr)	EU (yrs)	(Ry) MG	(day 3)	1
Summer Dermal Absorption	rption							1		1	1
South Nes	1			0.5	. 275	- ·	7.1	1	Q.4		
1000	33638	c	!	0	0.275	_	7.1	20.42		12775	0.0E+00
took droit				0.5	0.275		7.1		4.5		
MOI IN INC.											

Bald eagle intake for fog oil under Pasquill Category B.

	Distance	Fog Oil Concentration	entration								0
	Œ	(a/w _s)	ام	Inti	Intake Rate (m³/day)	'day)	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Value (n/kg-day)
Minter Inhabition				Daily IR	Hourly IR	Event IR					(App Rus) com
II II II II II II II II II II II II II											
	4000			1.31	0.055	0.082	7.4	44.60	1		
	4000		5	1.31	0.055			000	Ç.1.		
	2000	0.002	2	131	0.055			14.06	4.5	-	
	2000	-	-		3 6	0.002	17	14.58	4.5	12775	2.9E-07
	0009			1.01	0.055			14.58	4.5		
	2000		0	1.31	0.055	0.082	7.1	14.58	4.5		
	8000	***************************************	0	1.31	0.055			14 58	7	-	
	12000	0.0001	-	1.31	0.055	0.082	7.7	2 2	0	c)/7L	2.9E-08
								14.30	6.4		
٠											
	Distance	Fog Oil Deposition	Prev SA	11000							
	Œ	(g/m²)	(m²)	(g)	CF (g/g)	Intake Rate (g/day)	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Daily Chronic Intake Value (o/ko-dav)
Winter Ingestion											10.00
	4000	0.01	0.0874	0.815	0.0044	2000					
	2000	0	0.0874	0.815	5000	292.0		14.58	4.5	İ	5.6E-04
	9009		0.0874	0.815	0000	299.0		14.58	4.5		2.8E-04
	7000		0.0874	0.845	7000	234.3		14.58	4.5		1.1E-04
	9500		0.0874	0.815	1000	299.0		14.58	4.5		5.7E-05
	14000	0.0002	0.0874	0815	0000	250.0		14.58	4.5		
	20000	0.0001	0.0874	100	0000	231.0		14.58	4.5		1.1E-05
				2	0.000	2,88.2	7.1	14.58	4.5	12775	
	Distance (m)	Fog Oil Concentration	ntration								Dermally Absorbed
				okin Surface Area (m*)	Area (m°)	ABS	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Dose (g/kg-day)
Winter Dermal Absorption	tion										
	4000	0.01		0.275	2		7.4	7.4.70			
	2000	0.005		0.275	9	-	7.1	44.50	4.5	12775	4.9E-06
	0009	0.002		0.275	5	-	7.4	2 2	C.	12//5	2.5E-06
	7000	0.001		0.275	5			4.30	4.5	12775	9.9E-07
	9200	0.0005		0.275	2		7.4	1.00	0.4	12775	4.9E-07
	14000	0.0002		0.275	5	-	7.1	24.50	U. 1	12//5	2.5E-07
	20000	0.0001		0.275	5		7.4	4.00	0.4	12775	9.9E-08
								00.7	Ú.	12//5	4.9E-08
									•	-	

Bald eagle intake for fog oil under Pasquill Category B.

				•							
Mobile Smoke											
	Distance	Fog Oil Concentration	entration		,						Dally Chronic Intake
	Ē	(g/m³)		In	Intake Rate (m³/day)	lay)	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
				Dally IR	Hourly IR	Event IR					
Winter Inhalation										1	
	4000	0.01		1.31	0.055			14.58	4.5	12775	
	4000	0.005		1.31	0.055			14.58	4.5		
	4000	0000		1.31	0.055			14.58	4.5		
	2002	0.004		131	0.055	0.136	25.3	14.58	4.5	12775	
	200	0000		131	0.055			14.58	4.5		
	OOOC	0,000		10.1	2000			14 58	4.5		
	7000	0.000	7	1.31	0.000			9	2		
	9000	0.000	_	1.31	0.055	0.136		14.58	6.4		
		Feg Oil									
	Distance	Deposition	Prey SA	Prey Weight		intake Rate				;	Dally Chronic Intake
	Œ	(g/m²)	(m²)	(g)	CF (9/9)	(a/day)	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
						Dally IR					
Winter Ingestion											-
*	4000	0.01	0.0874	0.815				14.58	4.5	-	
	2000	0.005	0.0874					14.58	4.5		
	0009	0.002	0.0874		0.0002	294.5	25.3	14.58	4.5	12775	
	7500	0.001	0.0874					14.58	4.5	}	
	9500	0.0005	0.0874					14.58	4.5		
	14500		0.0874					14.58	4.5	12775	
	20000		0.0874					14.58	4.5		2.1E-05
	Distance	Fog Oll Concentration	entration								Dermally Absorbed
	Ê	(g/m²)	_	Skin Surfac	Skin Surface Area (m²)	ABS	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Dose (g/kg-day)
Winter Dermal Absorption											20 20 7
	4000			0.7	0.275		25.3	١	4.0		
	2000	900'0	3	0.2	0.276		26.3		4.5	l	
	0009		~	0	7.6		25.3		4.5		
	7500		_	0.2	0.275	,	25.3		4.5	12775	
	9500		5	0.2	75		25.3		4.5		
	14500	0.0002	2	0.2	0.275		25.3		4.6	1	
	20000		=	0.0	75		25.3	14.58	4		1.8E-07

Bald eagle intake for fog oil under Pasquill Category B.

	Distance	Fog Oil Concentration								
	Ē	(g/m³)	-	Intake Rate (m³/day)	day)	EF (davahr)	ED (vrs)	RW (P.C.)	AT (dmm)	-
			Dally IR	Hourly IR	Event IR			(Au)	(deys)	Value (g/kg-day)
Summer Inhalation										
Musgrave Hollow										
South Nest		o	1.3	0.055	0 136	26.3	2		-	
Mid Nest	t 27956	0	134		20.0			6.4	12/75	
North Nest			12.	200	0.130			4.5		
Bally McCann Hollow			5		0.136	25.3	20.42	4.5	12775	0.0E+00
South Nest	19717	0	13	0.055	9430					
Mid Nest	L				0.130			4.5		
North Nest	44956		213		0.136		20.42	4.5	12775	0.0E+00
Mush Paddle Hollow	L		1.31	0.000	0.136	19.0	20.42	4.5	12775	
South Nest	20749	0	- 3	3900	2000					
Mid Nest					0.130		20.42	4.5		
North Nest					0.130		20.42	4.5		
Ballard Hollow	L		2		0.136	15.8	20.42	4.5	12775	0.0E+00
South Nest	17463	0	131	0.055	0.136	100	1			
Mid Nest		c	100		2		20.42	4.5		
North Nest	34057		2 3	0.00	0.136		20.42	4.5	12775	
			1.31		0.136	12.7	20.42	4.5	12775	
								,		
			1							
	Distance	Fog Oll Concentration								Dermally Absorbed
		(/ /	oxin sunace Area (m²)	e Area (m ⁻)	ABS	EF (dayslyr)	ED (yrs)	BW (kg)	AT (days)	Dose (g/kg-day)
Summer Dermal Absorption	100						-			
Muscrave Hotlow										
South Macs	70000									
Men Need	47107		0.275	22	-	25.3	20.42	4.5		0.05+00
Morth Nest	40044	0	0.275	92	-	25.3	20.42	4.5		0 DE+00
Bally McCann Hollow	10701		0.275	92	-	25.3	20.42	4.5	12775	0.0E+00
South Nest	19717	0 0004		1						
Mid Nest	23623	000	0.273	0	-	19.0	20.42	4.5	12775	1.9E-07
North Nest	44956		0.279	0 4	-	19.0	20.42	4.5	12775	0.0E+00
Mush Paddle Hollow		<u></u>	0.2/3			19.0	20.42	4.5	12775	0.0E+00
South Nest	20749	0								
Mid Nest	28050		0.273			15.8	20.42	4.5	12775	0.0E+00
North Next	49712		0.2		7	15.8	20.42	4.5	12775	0.0E+00
Ballard Hollow	41		0.770		-	15.8	20.42	4.6	12775	0.0E+00
South Nest	47463	- 0000								
Mid Net	14677	0.000	0.275		-	12.7	20.42	4.5	12775	1.2E-07
North Month	1,010	0.0002	0.27	9	=	12.7	20.42	4.5	12775	2 5E-07
12011 111011	10000	0	0.275	.2	-	12.7	20.42	4.5	12775	00-100

Bald eagle intake for fog oil under Pasquill Category C.

Months Cilians	_										
	Distance	Fog Oil Concentration	entration	Ĭ	intake Rate (m³/dav)		EF (davahrr)	ED (vrs)	BW (kg)	AT (days)	Daily Chronic Intake Value (g/kg-day)
	Ē	(m/6)			ane nate (III)	1,00	14.00	1	(Au)	1	
				Dally IR	Hourly IR	Event IR		1			
Winter Inhalation									-		
	3000			1.31	0.055	0.136	25.3	14.58	4.5	12//5	
	3000	0.005		1.31	0.055	0.136	25.3	14.58	4.5		
	3000			1.31	0.055	0.136	25.3	14.58	4.5	12775	
	4500			1.31	0.055	0.136		14.68	4.5	12775	
	6500	50000		131	0.055	0.136		14.58	4.5		4.4E-07
	9500			131	0.055	0.136	25.3	14.58	4.5	12775	1.8E-07
	14000		-	131	0.055	0.136		14.58	4.5	12775	8.8E-08
	2001										
		Pengelilen	AR VAIG	Deatt Welcht		d e de de					Dally Chronic Intake
,	Distance (m)	(g/m²)	(a)	mgiaw (a)	CF (9/g)	(g/day)	EF (dayslyr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
						Dally IR					
Muter Indestion											
in a second	3000	0.04	0.0874	0.815	0.0011	292.5		14.58	4.5	12775	
	4000				1	293.5		14.58	4.5		
	2000				0.0002	294.5		14.58	4.5		4.1E-04
	8500	0.001			0.0001	295.5		14.58	4.5		
	12000		1			296.5	25.3	14.58	4.5		
	24000	0.0002				297.5		14.58	4.5	12775	
	40000				0.000	298.5		14.68	4.5		2.1E-05
	Distance	Fog Oll Concentration	entration								Dermally Absorbed
	E	(g/m²)		Skin Surface Area (m²)	e Area (m²)	ABS	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Dose (g/kg-day)
Winter Dermal Absorption											
	3000		_	0.275	75		25.3		6.4	1	
	4000	0.005	2	0.275	75	-	25.3		4.5	12775	
	2000		2	0.275	75	•	25.3		4.5		
	8500		1	0.2	0.275		25.3		4.5	12775	
	12000		35	0.2	75	-	25.3		4.5		
	24000		12	0.2	75		26.3		4.6	12775	
	40000		5	0.2	0.276		25.3	14.58	4.5		1.8E-07
			l							L	

Bald eagle intake for fog oil under Pasquill Category C.

	Distance	Fog Oll Concentration	traffon								
	Ē	(a/m ₂)		Int	Intake Rate (m³/day)	day)	EF (days/yr)	ED (vrs)	BW (kg)	AT (daye)	Value (effect day)
				Daily IR	Hourty IR	Event IR		1_	(Au)	71 (ddys)	value (g/kg-day)
Summer inhalation											
Musgrave Hollow											
South Nest		0		1.31	0.055	0 136		00			
Mid Nest	27956	0		12.	9000	300	2.53	74.C	4.0	i	0.0E+00
North Nest	L				200	0.130		20.42	4.5		0.0E+00
Bally McCann Hollow				10.1	cco.n	0.136		20.42	4.5	12775	0.0E+00
South Nest	19717				9000						
Mid Nest	L			2 3	0.030	0.136			4.5	12775	0.0E+00
North Meet	AAORE			2	0.000	0.136	19.0		4.5		
Mush Paddle Hollow				1.31	0.055	0.136		20.42	4.5		
Anna Marie											
South Nest	20/49			1:31	0.055	0.136	15.8	20.42	4.5	12775	00100
Mid Nest				1.31	0.055	0.136		20.42	4.5		
North Nest	49712	٥		1.31	0.055	0.136		20.42	27		0.05+00
Daliard Hollow											
South Nest				1.31	0.055	0.136		20.42	4.5	-	
Mid Nest		0.0001		1,31	0.055	0.136		20.42	2,4	27.72	
North Nest	34057	0		131	0 0055	921 0	Ç	20.00			
								40.42	6.4	12/75	0.0E+00
								1			
	Distance	Fog Oil Concentration	atlon								Character A. C. C.
	Œ	(a/m²)		Skin Surface Area (m²)	Area (m²)	ABS	EF (dayslyr)	ED (yrs)	BW (kg)	AT (days)	Dose (g/kg-day)
Summer Dermal Absorption	5										
Miscrate College	2										
Court Name			1								
South Nest	4/107	0.0001		0.275		1	25.3	20.42	4.5	12775	2 55.07
Morth Mose		0.000	1	0.275	5	-	25.3	20.42	4.5		2.5F-07
Bally McCann Lotton	40711	0.0001	1	0.275	_	-	25.3	20.42	4.5	12775	2.5F-07
South Nect	10747	- 0000									
Mid Neet		0.0002		0/7/0		-	19.0	20.42	4.5	12775	3.7E-07
North Mast		0.0002	T	0.275		-	19.0	20.42	4.5		3.7E-07
Mush Paddle Hollow	2000	_		0.275		-	19.0	20.42	4.5	12775	0.0E+00
South Nest	20749	9000	1								
Mid Nest		0.0004	T	0.273			15.8	20.42	4.5	12775	7.7E-07
North Nest		200	1	0.270		-	15.8	20.42	4.5	12775	1.5E-07
Ballard Hollow		<u>,</u> -	T	0.2/0		-	15.8	20.42	4.5	12775	0.0E+00
South Nest	17463	0.0002		0 275		ľ	1	1			
Mid Nest	11677	0.0005		0 275		1	77	20.42	4.5	12775	2.5E-07
North Nest	34057	0.0001		275.0		- -	/7!	20.42	4.5	12775	6.2E-07
							12./	20.42	4.5	12775	4 2E-07

Bald eagle intake for fog oil under Pasquill Category D.

Mobile Smoke								Ì			
	Distance	Fog Oll Concentration	entration	- <u>i</u>	- Jacobs Date (m ³)day)	Ş	EF (daveby)	ED (vie)	BW (ka)	AT (davs)	Dally Chronic Intake Value (o/kg-dav)
	(E)	(g/m²)			ake Kare (m /c	jay)	Er (dayayı)	ED (yes)	(Au) and	fodan)	In Rush anin
				Dally IR	Hourly IR	Event IR					
Winter Inhatation									1	1	
	2500	0.01		1.31	0.055	0.136		14.58	6.4	İ	8 8E-00
	3000	0.005		1.31	0.055	0.136		14.58	4.5		4.4E-06
	4500			1.31	0.055	0.136		14.58	4.5		1.8E-06
	8000			1.31	0.055	0.136		14.58	4.5		8.8E-07
	0500		2	1.31	0.055	0.136		14.58	4.5		
	16500	0000		131	0.055	0.136	25.3	14.58	4.5	12775	1.8E-07
	0000			134	0.055	0 136		14.58	4.5		8.8E-08
	00007			2.							
		100 001									
	Distance	Deposition	Prey SA	Prey Weight		intake Rate					Dally Chronic Intake
	Ξ	(a/m²)	E.	6	CF (9/9)	(alday)	EF (dayslyr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
						Dally IR					
Winter Ingestion											
and a second	6500	0.0	0.0874	0.815	0.0011	292.5		14.58	4.5	12775	2.0E-03
	8500			0.815	0.0005			14.58	4.5		
	14500		ļ	0.815	0.0002	294.5		14.58	4.5	12775	4.1E-04
	22000			0.815	0.0001	295.5		14.58	4.6		
	35500		1			296.5	25.3	14.58	4.5		
	50000+		1	0.815	0.0000			14.58	4.5	1	
-	++00009	0.0001						14.58	4.5		2.1E-05
	Distance	Fog Oil Concentration	entration								Dermally Absorbed
	Œ	(g/m²)	')	Skin Surface Area (m²)	e Area (m²)	ABS	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Dose (g/kg-day)
Winter Dermal Absorption						ľ	100	977	37	47775	4 AE-05
	6500			0.7	0.275		20.0	2	3		
	8500		2	0.2	6/2.0		20.0	14.30	2		
	14500	0.002	2	0	0.275		20.3	14.30			
	22000		-	20	0.273		20.2	0.4.0			
	35500	0.0005	55	0	0.275		20.3	44.00	2		
	20000+		72	0.0	0.270		69.3	1.00			10 10 1
	\$0000++		=	ö	0.275		25.3	14.58	6.4	17//2	
										1	

Bald eagle intake for fog oil under Pasquill Category D.

	Distance (m)	Fog Oll Concentration		Cartiford and Market	1	:				⊢
				Mane Mare (III)	ray)	Er (daysiyr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
Summer inhalation			Daily IR	HOUTH IK	Event IR					
Musgrave Hollow										
South Nest	t 25174	0 0001	131	2000						
Mid Nest			134			25.3		4.5	12775	1.2E-07
North Nest			5	0000	0.136			4.5	j	0.0E+00
Baily McCann Hollow			5	0.000	0.136		20.42	4.5	12775	0.0E+00
South Meet	10747	10000	1							
Mid Ment			1.31	0.055	0.136			4.5	12775	9.2E.08
WIN YES		٥	1.31		0.136	19.0	20.42	4.5		
North Nest	44956	0	1.31	0.055	0.136			4.5		
Mush Paddle Hollow								7		0.0E+00
South Nest	t 20749	0.0001	1,31	0.055	0 136	15.8	CF 0C			
Mid Nest		0	1.31	0.055	0 136			C.A.	C//ZI	
North Nest	49712	0	131	0.055	426	0.00	20.02	6.5		
Ballard Hollow				200.5	0.130			4.5	12775	0.0E+00
South Nest	17463	0.0001	134	0.055	0 436		/ 8			
Mid Nest	11677	0,000	**	200	0:130		20.42	4.5	ı	6.1E-08
Page AtroN		7000	3	0000	0.136	12.7	20.42	4.5	12775	1.2E-07
		0	1.31	0.055	0.136		20.42	4.5		
				†						
	Distance	Fog Oil Concentration		•						Dermally Absorbed
	É	(m/6)	Skin Surface Area (m²)	Area (m²)	ABS	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Dose (g/kg-day)
Jummer Ocemel Absent										
Mineral Dermai Absorption	uo.									
Musgrave Hollow										
South Nest	25174	0.0005	0.275	9	-	263	20.42	77	37775	
Mid Nest		0.0005	0.276	9	-	26.3	20.43			
North Nest	48211	0.0002	0.276			28.2	2000		1	1.2E-06
Bally McCann Hollow						200	20.02	4	12//2	4.9E-07
South Nest	19717	0.001	0.275	٩	-	40,4	20.50			
Mid Nest		0.0005	0.275		1	200	20.02	0.4	17//2	
North Nest		0.0002	0 275			2.6	20.42	6.4		
Mush Paddle Hollow				<u></u>		0.6	20.42	4.5	12775	3.7E-07
South Nest	20749	0.001	0.275	95	-	947	9			
Mid Nest		0 0005	27.5 0			0.01	20.92	4.5	.	1.5E-06
North Nest		0 0002	37.00		1	0.02	20.42	4.5		7.7E-07
Ballard Hollow						15.8	20.42	4.5	12775	3.1E-07
South Nest	17463	0.0001	0.275	2	ľ	100	9			
Mid Nest		0.002	0.275		•	12.0	20.42	6.4	1	
North Nest		0.0005	0.275	+	1	12.7	20.42	4.5	12775	2.5E-06
		2000	7.7	,		12.7	20.42	4.5		

Bald eagle intake for fog oil under Pasquill Category E.

Mobile Smoke	_		-		_		_	_		_	
								l			
	Distance	Fog Oil Concentration	intration								Daily Chronic Intake
	ε	(_e m/6)		Int	intake Rate (m³/day)	fay)	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
				Daily IR	Hourly IR	Event IR					
Winter inhalation											
	3000	0.01		1.31	0.055	0.136	25.3	14.58	4.5		
	4000	0.005		1.31	0.055	0.136		14.58	4.5		4.4E-06
	7007	0.002		1.31	0.055	0,136		14.58	4.5		
	10000	0.00		1.31	0.055	0.136		14.58	4.5		
	16000			1.31	0.055	0.136		14.58	4.5	12775	
	9000			131	0.055	0.136		14.58	4.5	12775	
	2000	10000		134	0.055	0 136		14.58	4.5	12775	8.8E-08
	nonne	0.000		5	8	3					
		Fed Oil									
	Distance	Deposition	Prey SA	Prey Welght		intake Rate					Dally Chronic Intake
	Ê	(g/m²)	(m³)	(6)	CF (9/9)	(g/day)	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
						Dally IR					
Winter Ingestion										١	-
	7500	0.01	0.0874	0.815			25.3		4.5		
	10000		0.0874						4.5		
	18000		0.0874						4.5		4.1E-04
	30000		0.0874						4.5		
	20000		0.0874	0.815					4.5		1.0E-04
	\$0000+		0.0874						4.6	12775	
	++00009	0.0001	0.0874	0.815	0.0000	298.5		14.58	4.5		2.1E-05
	Distance	Fog Oil Concentration	entration		-					,	Dermally Absorbed
	£	(g/m²)	,	Skin Surface Area (m²)	• Area (m²)	ABS	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Dose (g/kg-day)
Winter Dermal Absorption							150		37.		1 8E-05
	7500			0.2	0.275		20.3			1	
	10000		2	0.2	0.275		25.3			12//2	
	18000	0.002	~	0.2	0.275	-	25.3	14.58		1	
	30000		_	0.2	0.275	1	25.3				
	20000		ç,	0.2	0.275		25.3	14.58			
	\$0000+		2	0.2	0.275		25.3			5 12775	
	++00009		-	0.2	0.275	-	1 25.3		4.5		1.8E-07

Baid eagle intake for fog oil under Pasquill Category E.

Musgrave Hollow Musgrave Hollow South Nest Mid Nest Mid Nest Mid Nest North Nest Mid Nest North Nest Mid Nest North Nest South Nest South Nest South Nest South Nest Mid Nest North Nest South Nest Mid Nest North Nest Mid Nest North Nest North Nest North Nest North Nest North Nest North Nest North Nest North Nest North Nest North Nest North Nest	25174 27956 48211		Daily IR	(App. an)	93)	ET (Gayanya)	_	BW (kg)	AT (days)	Value (after day)
Musgrave Hollow South Neet Mid Neet Mid Neet North Neet Mid Neet Mid Neet Mid Neet Mid Neet Mid Neet North Neet	25174 27956 48211		ALL ALL ALL ALL ALL ALL ALL ALL ALL ALL				10.1			(ADD_RUK) anima
Musgrave Hollow South Nest Mid Nest Mid Nest North Nest Mid Nest Mid Nest Mid Nest Mid Nest Mid Nest Mid Nest Mid Nest Mid Nest Mid Nest Mid Nest Mid Nest Mid Nest Mid Nest Mid Nest Mid Nest Mid Nest Mid Nest Mid Nest North Nest Mid Nest North Nest North Nest North Nest Mid Nest North Nest	25174 27956 48211			Hourny JK	Event IR					
Bally McCann Hollow Bally McCann Hollow South Nest Mid Nest Mid Nest Mid Nest Mid Nest Mid Nest Mid Nest Mid Nest Mid Nest Mid Nest Mid Nest Mid Nest Mid Nest Mid Nest Mid Nest North Nest Mid Nest North Nest North Nest	25174 27956 48211			İ						
Mid Nest North Nest South Nest Mid Nest Mid Nest Mid Nest Mid Nest Mid Nest Mid Nest South Nest Mid Nest Mid Nest Mid Nest Mid Nest Mid Nest North Nest North Nest North Nest North Nest North Nest North Nest North Nest	27956	0.0002	+ 34	0.000						
Auth North Nest South Nest Mid Nest Mush Paddle Hollow Mid Nest South Nest North Nest North Nest North Nest North Nest North Nest Mid Nest North Nest North Nest North Nest North Nest	48211	0.0002		0.000	0.136	25.3		4.5	12775	2.5F-07
South Nest Mid Nest Mid Nest North Nest North Nest Mid Nest Mid Nest Mid Nest Mid Nest North Nest South Nest South Nest South Nest North Nest North Nest North Nest		0000	201	CCO	0.136		20.42	4.5		
South Nest Mid Nest North Nest Mid Nest Mid Nest Mid Nest Mid Nest North Nest South Nest South Nest Mid Nest North Nest North Nest North Nest North Nest			1.31	0,055	0.136	25.3	20.42	4.5		
Mid Nest North Nest North Nest South Nest Mid Nest North Nest South Nest North Nest Mid Nest North Nest North Nest North Nest	19717	2000								
North Nest Nush Paddie Hollow South Nest Mid Nest North Nest South Nest South Nest Mid Nest Mid Nest Mid Nest North Nest	23523	20000	1.31	0.055	0.136	19.0	20.42	4.5	47776	
lush Paddie Hollow South Nest Mid Nest North Nest South Nest South Nest Mid Nest North Nest North Nest	27027	0.0002	1.31	0.055	0.136		20.42			
USD Faddle Hollow South Nest Mid Nest North Nest South Nest South Nest Mid Nest North Nest	44956	0.0001	1.31	0.055	0 136		24:07	6.9	}	
South Nest Mid Nest Mid Nest North Nest South Nest Mid Nest North Nest					200		20.42	4.5	12775	9.2E-08
Mid Nest North Nest allard Hollow South Nest Mid Nest North Nest	20749	0.0002	131	0.055						
Alard Hollow South Nest Mid Nest North Nest	28050	0 0000		000	0.136	15.8	20.42	4.5	12775	1.5E.07
allard Hollow South Nest Mid Nest North Nest	49712	10000	5	cono	0.136	15.8	20.42	4.5		
South Nest Mid Nest North Nest		0000	1.31	0.055	0.136	15.8	20.42	4.5	47775	
Mid Nest North Nest	47.452				,					
North Nest		0.0002	1.31	0.055	0.136	12.7	20.42	1,5		
NOTICE TARK	//01	0.0005	1.31	0.055	0.136	12.7	20.42	2.4		
	3405/	0.0001	1.31	0.055	0.136	12.7	2000		0//71	
							20.42	6.4		6.1E-08
							+			
	1									
Dist	Distance	Fog Oil Concentration					T			
5	ε	(g/m²)	Skin Surface Area (m2)	Area (m²)						Dermally Absorbed
					202	Er (dayslyr)	ED (yrs)	BW (kg)	AT (days)	Dose (a/ka-dav)
Summer Dermal Absorption	\mid									
Musgrave Hollow										
h Nest	25174	5000								
Mid Nest	27956	1000	0.273		=	25.3	20.42	4.5	12775	2 AE.06
North Nest	48211	0,0005	0.273		-	25.3	20.42	6.4	12775	2 55.06
L	-	0000	0.2/3		-	25.3	20.42	4.5	12775	1 25.06
South Nest	19717	1000								20.
	23623	1000	0.275		-	19.0	20.42	4.5	12775	1 95.06
North Nest	44956	70000	0.273		=	19.0	20.42	4.5	12775	1 95.06
			0.273		=	19.0	20.42	4.5	12775	7.4E-07
South Nest	20749	0 001	2000	1						
Mid Nest	28050	0.002	0.075		-	15.8	20.42	4.5	12775	1.5F.08
orth Nest	49712	0 0005	0.673			15.8	20.42	4.5	12775	3 1E.06
	-		0.2/3		-	15.8	20.42	4.5	12775	7 7E 07
South Nest	17463	0,000		-						
Mid Nest	11677	0000	0.270		-	12.7	20.42	4.5	12775	20 13 0
	34057	2000	0.275		-	12.7	20.42	4.5	17775	2.35-06
		2,000	0.275		-	12.7	20.42	14	2000	Z.3E-06

Attachment E: Terephthalic Acid (TPA) Grenades

TPA Smoke Grenade											
	Distance						u i			1	Delly Chronic Intak
	Œ	TPA Concentra	Concentration (g/m3)	ſu	Intake Rate (m³/day)	/day)	(eventlyr)	ED (yrs)	BW (kg)	AT (days)	AT (days) Value (g/kg-day)
				Daily IR	Hourty IR	Event IR					
Winter Inhalation											
	3000	6		3.4E-04	1.4E-05			14.58	4.5		
	4000	0.00	5	3.4E-04	1.4E-05	5.9E-07	2242	14.58	4.5		
	4000		2	3.45.04	,				4.5		
	4000		-	3.4E-04		5.9E-07	2242	14.58	4.5		
	2000	0.0005	8	3.4E-04	1.4E-05	5.9E-07	2242	14.58	4.5		
	2000		72	3.45-04		5.9E-07	2242	14.58	4.5		
	9009		21	3.4E-04	1.4E-05	5.9E-07	2242	14.58	4.5	12775	3.4E-1

Attachment E: TPA Smoke Pots

Distance										
_	- Superior					Ш				Daily Chronic Intake
E		TPA Concentration (g/m3)	int	intake Rate (m³/day)	(day)	(eventlyr)	ED (yrs)	BW (kg)	AT (days)	AT (days) Value (g/kg-day)
			Daily IR	Hourty IR	Event IR					
Winter Inhalation										
	3000	o	3.4E-04	1.4E-05	5.9E-07	056	14.58	4.5	12775	1.35-06
	4000	0.005	3.4E-04	1.4E-05	5.9E-07	950	14.58	4.5	12775	7.1E-10
	2000	0.002	3.4E-04	1.4E-05	5.9E-07	056	14.58	4.5	12775	2.8E-10
	2000	0.001	3.4E-04	1.4E-05	2.9E-07	056	14.58	4.5	12775	1.4E-10
	2000	0.0005	3.4E-04	1.4E-05	5.9E-07	950	14.58	4.5	12775	7.1E-1
	000	0.0002	3.4E-04	1.4E-05	5.9E-07	950	14.58	4.5	12775	2.8E-1
	2000	0.0001	3.4E-04	1.4E-05	5.9E-07	950	14.58	4.5	12775	1.4E-1

Attachment E: Titanium Dioxide Grenades

Bald eagle intake for titanium dioxide under Pasquill Category E.

-	Distance (m)	Concentration (g/m3)	Tut.	intake Rate (m³/day)	lay)	EF (eventlyr)	ED (yrs)	BW (kg)	AT (days)	Dally Chronic Intake Value (g/kg-day)
			Daily IR	Hourly IR	Event IR					
Summer Inhalation						***************************************				
	100	0.01	3.4E-04	1.4E-05	5.9E-07		20.42	4.5	12775	
-	300	0.005	3.4E-04	1.4E-05	5.9E-07	48	20.42	4.5		
	200	0.002	3.4E-04	1.4E-05	5.9E-07	48	20.42	4.5		
	2007	0,001	3.4E-04	1.4E-05	5.9E-07		20.42	4.5		
	1000	0.0005	3.4E-04	1.4E-05	5.9E-07	48	20.42	4.5	12775	5.0E-12
	1400	0.0002	3.4E-04	1.4E-05	5.9E-07	48	20.42	4.5	12775	
	1800	0.0001	3.4E-04	1.4E-05	5.9E-07	48	20.42	4.5	12775	1.0E-12
	Distance									Daily Chronic Intake
	(m)	Concentration (g/m3)	Int	Intake Rate (m³/day)	lay)	EF (eventlyr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
The state of the s			Daily IR	Hourly IR	Event IR					
Winter Inhalation										
	100	0.01	3,4E-04		5.9E-07		14.58	4.5	12775	
	300		3.4E-04	1.4E-05	5.9E-07	48	14.58	4.5	12775	3.6E-11
	200		3.4E-04		5.9E-07	48	14.58	4.5		1.4E-11
	700		3.4E-04	1.4E-05	5.9E-07	48	14.58	4.5	12775	7.2E-12
	1000	0.0005	3.4E-04	1.4E-05	5.9E-07	48	14.58	4.5		
	1400		3.4E-04	1.4E-05	5.9E-07	48	14.58	4.5	12775	1.4E-12
The second secon	1800	0.0001	3.4E-04	1.4E-05	5.9E-07	48	14.58	4.5	12775	7.2E-13
AND AND AND AND AND AND AND AND AND AND										

Attachment F Risk Characterization - Indiana Bat

RISK PARAMETERS FOR INDIANA BATS

Summer Foraging/Roosting Inhalation

Parameter	Abbreviation	Definition
Distance		Number of meters from chemical source to exposure point.
Daily Acute Intake Value		Amount of stressor taken in by the receptor per day.
Daily Chronic Intake Value		Amount of stressor taken in by the receptor, averaged over its lifetime, per day.
Acute Toxicity Value		Single chemical exposure.
Chronic Toxicity Value		Chemical exposure averaged over the receptor's lifetime.
Acute Toxicity Reference Value Uncertainty Adjustment	Acute TRV Uncertainty Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological differences between test species and species of concern (receptors).
Chronic Toxicity Reference Value Uncertainty Adjustment	Chronic TRV Uncertainty Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological differences between test species and species of concern (receptors), averaged over the receptor's lifetime.
Acute Toxicity Reference Value	Acute TRV	Adjusted (with uncertainty factors) toxicological reference values used as measurement endpoints. A TRV was developed for each receptor.
Chronic Toxicity Reference Value	Chronic TRV	Adjusted (with uncertainty factors) toxicological reference values used as measurement endpoints, averaged over the receptors lifetime. A TRV was developed for each receptor.
Chronic Dose Adjusted Toxicity Reference Value	Chronic Dose Adjusted TRV	A toxicological value adjusted by multiplicative uncertainty factors for chronic (averaged over the receptor's lifespan) exposure.
Acute Hazard Quotient		Equal to expected exposure concentration acute divided by TRVscute.
Chronic Hazard Quotient		Equal to daily intakechronic divided by TRVchronic
Acute Effect		Acute Effect = yes, if Acute Hazard Quotient>1. Acute Effect = no, if Acute Hazard Quotient <1.
Chronic Effect		Chronic Effect = yes, if Chronic Hazard Quotient>1. Chronic Effect = no, if Chronic Hazard Quotient<1.

Summer Foraging/Roosting Ingestion

Parameter	Abbreviation	Definition
Distance		Number of meters from chemical source to exposure point.
Daily Acute Intake Value		Amount of stressor taken in by the receptor per day.
Daily Chronic Intake Value		Amount of stressor taken in by the receptor, averaged over its lifetime, per day.
Acute Toxicity Value		Single chemical exposure.
Chronic Toxicity Value		Chemical exposure averaged over the receptor's lifetime.
Acute Toxicity Reference Value Uncertainty Adjustment	Acute TRV Uncertainty Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological differences between test species and species of concern (receptors).
Chronic Toxicity Reference Value Uncertainty Adjustment	Chronic TRV Uncertainty Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological differences between test species and species of concern (receptors), averaged over the receptor's lifetime.
Acute Toxicity Reference Value	Acute TRV	Adjusted (with uncertainty factors) toxicological reference values used as measurement endpoints. A TRV was developed for each receptor.
Chronic Toxicity Reference Value	Chronic TRV	Adjusted (with uncertainty factors) toxicological reference values used as measurement endpoints, averaged over the receptors lifetime. A TRV was developed for each receptor.
Acute Hazard Quotient		Equal to expected exposure concentration acute divided by TRV acute.
Chronic Hazard Quotient		Equal to daily intake chronic divided by TRV chronic.
Acute Effect		Acute Effect = yes, if Acute Hazard Quotient>1. Acute Effect = no, if Acute Hazard Quotient <1.
Chronic Effect		Chronic Effect = yes, if Chronic Hazard Quotient>1. Chronic Effect = no, if Chronic Hazard Quotient<1.

RISK PARAMETERS FOR INDIANA BATS

Summer Foraging/Roosting Dermal Absorption

Parameter	Abbreviation	Definition
Distance		Number of meters from chemical source to exposure point.
Daily Acute Intake Value		Amount of stressor taken in by the receptor per day.
Skin Surface Area		Surface area of receptor.
Dermally Absorbed Dose		Amount of chemical stressor dermally absorbed by receptor.
Acute Toxicity Value		Single chemical exposure.
Chronic Toxicity Value		Chemical exposure averaged over the receptor's lifetime.
Acute Toxicity Reference Value Uncertainty Adjustment	Acute TRV Uncertainty Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological differences between test species and species of concern (receptors).
Chronic Toxicity Reference Value Uncertainty Adjustment	Chronic TRV Uncertainty - Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological differences between test species and species of concern (receptors), averaged over the receptor's lifetime.
Acute Toxicity Reference Value	Acute TRV	Adjusted (with uncertainty factors) toxicological reference values used as measurement endpoints. A TRV was developed for each receptor.
Chronic Toxicity Reference Value	Chronic TRV	Adjusted (with uncertainty factors) toxicological reference values used as measurement endpoints, averaged over the receptors lifetime. A TRV was developed for each receptor.
Acute Hazard Quotient		Equal to expected exposure concentration _{acute} divided by TRV _{acute} .
Chronic Hazard Quotient		Equal to daily intake chronic divided by TRV chronic
Acute Effect		Acute Effect = yes, if Acute Hazard Quotient>1. Acute Effect = no, if Acute Hazard Quotient <1.
Chronic Effect		Chronic Effect = yes, if Chronic Hazard Quotient>1. Chronic Effect = no, if Chronic Hazard Quotient<1.

Winter Hibernation Inhalation

Parameter	Abbreviation	Definition
Distance	,	Number of meters from chemical source to exposure point.
Daily Acute Intake Value		Amount of stressor taken in by the receptor per day.
Daily Chronic Intake Value		Amount of stressor taken in by the receptor, averaged over its lifetime, per day.
Acute Toxicity Value		Single chemical exposure.
Chronic Toxicity Value		Chemical exposure averaged over the receptor's lifetime.
Acute Toxicity Reference Value Uncertainty Adjustment	Acute TRV Uncertainty Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological differences between test species and species of concern (receptors).
Chronic Toxicity Reference Value Uncertainty Adjustment	Chronic TRV Uncertainty Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological differences between test species and species of concern (receptors), averaged over the receptor's lifetime.
Acute Toxicity Reference Value	Acute TRV	Adjusted (with uncertainty factors) toxicological reference values used as measurement endpoints. A TRV was developed for each receptor.
Chronic Toxicity Reference Value	Chronic TRV	Adjusted (with uncertainty factors) toxicological reference values used as measurement endpoints, averaged over the receptors lifetime. A TRV was developed for each receptor.
Chronic Dose Adjusted Toxicity Reference Value	Chronic Dose Adjusted TRV	A toxicological value adjusted by multiplicative uncertainty factors for chronic (averaged over the receptor's lifespan) exposure.
Acute Hazard Quotient		Equal to expected exposure concentration acute divided by TRV acute.
Chronic Hazard Quotient		Equal to daily intake chronic divided by TRV chronic.
Acute Effect		Acute Effect = yes, if Acute Hazard Quotient>1. Acute Effect = no, if Acute Hazard Quotient <1.
Chronic Effect		Chronic Effect = yes, if Chronic Hazard Quotient>1. Chronic Effect = no, if Chronic Hazard Quotient<1.

RISK PARAMETERS FOR INDIANA BATS

Winter Hibernation Dermal Absorption

Parameter	Abbreviation	Definition
Distance		Number of meters from chemical source to exposure point.
Daily Acute Intake Value		Amount of stressor taken in by the receptor per day.
Skin Surface Area		Surface area of receptor.
Dermally Absorbed Dose		Amount of chemical stressor dermally absorbed by receptor.
Acute Toxicity Value		Single chemical exposure.
Chronic Toxicity Value		Chemical exposure averaged over the receptor's lifetime.
Acute Toxicity Reference Value Uncertainty Adjustment	Acute TRV Uncertainty Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological differences between test species and species of concern (receptors).
Chronic Toxicity Reference Value Uncertainty Adjustment	Chronic TRV Uncertainty Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological differences between test species and species of concern (receptors), averaged over the receptor's lifetime.
Acute Toxicity Reference Value	Acute TRV	Adjusted (with uncertainty factors) toxicological reference values used as measurement endpoints. A TRV was developed for each receptor.
Chronic Toxicity Reference Value	Chronic TRV	Adjusted (with uncertainty factors) toxicological reference values used as measurement endpoints, averaged over the receptors lifetime. A TRV was developed for each receptor.
Acute Hazard Quotient		Equal to expected exposure concentration acute divided by TRVacute.
Chronic Hazard Quotient		Equal to daily intake _{chronic} divided by TRV _{chronic} .
Acute Effect		Acute Effect = yes, if Acute Hazard Quotient>1. Acute Effect = no, if Acute Hazard Quotient <1.
Chronic Effect		Chronic Effect = yes, if Chronic Hazard Quotient>1. Chronic Effect = no, if Chronic Hazard Quotient<1.



Attachment F: Fog Oil - Static Smoke

Indiana bat risk characterization for fog oil exposure under Pasquill Category B.

						Chronic	Acute TRV	Chronic TRV	Acute		Chronic Dose	Acute	Chronic		
	Distance		•	Dally Chronic Intake	Acute Toxicity	Toxicity Value	Uncertainty	Uncertainty	TRV	Chronic	Adjusted TRV	Hazard	Hazard	Acute	Chronic
	Œ)	Dally Acute Intake Value (g/m²)	te Value (g/m²)	Value (g/kg-dæy)	Value (g/m³)	(g/m³)	Adjustment	Adjustment	(g/m³)	TRV (g/m³)	(g/kg-day)	Quotlent	Quotient	Effect	Effect
	-														
Winter Hibermation Innaiation	lation														
Brooks			04	2.0E-09		0.1	16	160	<u> </u>		2.1E-07				2
Davis #2			93	6.4E-08		0.1	16	160	1_		2.1E-07		L		2
Wolf Den		1.0E-04	04	4.2E-09	09	0.1	16	160			2.1E-07	2.7E-05		2	2
yor	5447		2	3.5E-08		0.1	16	160		6.3E-04	2.1E-07		1.7E-01		8
Bally McCann Hollow															
Brooks			8	3.3E-09		0.1	16	160	3.8E+00	6.3E-04	2.15-07				No
Davis #2			02	6.7E-07	9	0.1	16	160	_ 1		2.1E-07		3.2E+00		Yes
Wolf Den			92	4.5E-07		0.1	16	160	3.8E+00	6.3E-04	2.1E-07				Yes
yor	2004	1.0E-02	02	5.3E-07		0.1	16	160			2.1E-07	L			Υes
Mush Paddle Hollow															
Brooks		0.0E+00	00	0.0E+00	09	0.1	16	160	3.8E+00	6.3E-04	2.15-07	L	0.0E+00	S	2
Davis #2	2889	1.0E-02	72	5.6E-07		0.1	16	160	3.8E+00	ļ	2.1E-07	L		2	Yes
Wolf Den		1.0E-04	7	2.6E-09		1.0	16	160	3.8E+00		2.15-07	2.7E-05			2
yor	1751	1.0E-02	72	3.4E-07		0.1	16	160	3.8E+00		2.1E-07				Yes
Ballard Hollow												L			
Brooks	8449		74	1.0E-09		0.1	16	160	3.8E+00	6.3E-04	2.1E-07	2.7E-05			S
Davis #2			00	0.0E+00		0.1	16	160	3.8E+00		2.15-07	Ц			S
Wolf Den		2.0E-04	24	4.5E-09	09	0.1	. 16	160	3.8E+00	6.3E-04	2.1E-07			S N	Ş
Joy	13821	0.0E+(8	0.0E+00		0.1	18	160	3.8E+00		2.1E-07		ı		Ş
"Acute critical effect is oil pneumonia. Critical Study. Shinn et al. 1987	I pneumonia.	Critical Study: Shin	in et al. 1987												
"Chronic critical effects	are minor lesk	ins of the heart, live	r and lungs. Crit		al. 1992										
		Daily Acute	149			Chronic	Acute TRV	Chronic TRV	Acute			Acute	Chronic		
	(m)			dose (o/ka-dav)	Value (q/kg)	(afka)	Adlustment	Adjustment	7 (kg)	- Caron	Chronic TRV (offer)	Distant	razard O:ioiion	Acute	Chronic
Winter Hibernation Dermal Absorption	af Absorption								T						
Musqrave Hollow															
Brooks			2.2E-02	6.4E-05		216	16	160	1.3E-01	-	4E+00	4.0E-03		2	2
Davis #2	6624		2.2E-02	1.3E-05		216	46	160	1.3E-01	-	1.4E+00	8.0E-04	9.55-06	운	202
Wolf Den		5.0E-04	2.2E-02	6.4E-05	2	216	16	160	1.3E-01	•	1.4E+00	4.0E-03		ટ્ટ	2
Joy	5447		2.2E-02	2.6E-05		216	16	160	1.3E-01	•	.4E+00	1.6E-03		ટ્ટ	2
Bally McCann Hollow		- 1													
Brooks		2.0E-04	2.2E-02	1.95-05	2	216	16	160	1.3E-01	-	.4E+00	1.6E-03		ν	S
Davis #2		١	2.2E-02	9.6E-04	2	216	16	160	1.3E-01		1.4E+00	8.0E-02		٥	No
Wolf Den	3861		2.2E-02	9.6E-04	2	216	16	160	1.35-01	-	1.4E+00	8.0E-02		No	No
you			2.2E-02	9.6E-04	2	216	16	160	1.3E-01	-	.4E+00	8.0E-02	7.1E-04	Š	S
Mush Paddle Hollow															
Brooks		2.0E-04	2.2E-02	1.6E-05	2	216	16	160	1.3E-01		.4E+00	1.6E-03		ž	Š
Davis #2	2889	1.0E-02	2.2E-02	8.0E-04	2	216	19	160	1.35-01		1.4E+00	8.0E-02	5.9E-04	ž	2
Wolf Den		5.0E-04	2.2E-02	4.0E-05	2	216	9	160	1.3E-01	-	1.4E+00	4.0E-03		S.	o N
yor	1751	İ	2.2E-02	8.0E-04	2	216	16	160	1.3E-01		1.4E+00	8.0E-02		S.	£
Ballard Hollow															
Brooks			2.7E-02	3.2E-05	7	216	16	160	1.35-01	-	1.4E+00	4.0E-03		운	운
Davis #2		2.0E-04	2.2E-02	1.3E-05	2	216	16	160	1.3E-01	•	1.4E+00	1.6E-03		운	No
Wolf Den		1.0E-03	2.2€-02	6.4E-05	2	216	16	160	1.3E-01	-	1.4E+00	8.0E-03		ş	No
yor	13821	2.0E-04	2.2E-02	1.3E-05	2	216	16	160	1.3E-01	•	.4E+00	1.6E-03	9.5E-06	£	Ş
*Acute critical effect is slight to moderate skin irritation. Critical Study: Palmer 1990	gnt to modera	te skin irritation. Cri	rtical Study: Pall	mer 1990											
Chronic craical effects are well defined elythema and edema. Craical Study. Lewis 1989	Ire well defined	s erymema and ede	ma. Critical Stur	dy: Lewis 1989											

Indiana bat risk characterization for fog oil exposure under Pasquill Category B.

Mobile Smoke															
						Chronic	Acute TRV	Chronic TRV	Acute		Chronic Dose	Acute	Chronic		
	(m)	Dally Acute Inta	Dally Acute Intake Value (g/m³)	Daily Chronic Intake Value (a/kg-dav)	*Acute Toxicity	Toxicity Value	Uncertainty	Uncertainty	TRV	Chronle	Adjusted TRV	Hazard	Hazard	Acute	Chronic
) manuarity	Adjustment	(Ju/6)	TRV (g/m²)	(g/kg-day)	Quotient	Quotient	Effect	Effect
Summer Foraging/Roosting Inhalation	sting inhalation														
	4000		1.0E-02	1.5E-06		6		ca.	2 55.00	10.0					
	4000		5.0E-03	7.6E-07			3	3	2 86.00	90.00	2.15-0/	2.7E-03		Ş	Yes
	4000	2.0E-03	5-63	3.0E-07				3 5	3.00		Z.1E-U/		j	ž	Yes
	2000		1.0E-03	1 SE-07				8	3.00+00		2.1E-07			SN No	Yes
	2000		-04	7.55.08				160	3.8E+00	_	2.15-07		7.2E-01	No	S
	7000		2 0F-04	00-10.r				160	3.8E+00	6.3E-04	2.1E-07			2	Š
	0006		1.0E-04	4.5F.08	8	5 6	9	160	3.8E+00	6.3E-04	2.1E-07			2	Š
				00-10-1			2	150	3.8E+00	6.3E-04	2.1E-07	2.7E-05	7.2E-02	o _N	ž
*Acute critical effect is oil oneumonia Critical Study Shinn et al. 1987	oneumonia.	Critical Study: Sh	ion at al 1987												
"Chronic critical affects are minor lesions of the bear liver and lines	are minor lest	nos of the heart lk												-	
		1 1991 110 110 110			1887										
	Oletance			Dotte: Of seconds		Chronic	Acute TRV	Chronic TRV	Acute			Acute	Chronic	Ī	
	(E)	Onthe A suite	the Mahas Called	Daily Chronic Intake	-	Toxicity Value	Uncertainty	Uncertainty	TRV			Hazard	Hazard	Acute	Chronic
	(iii)	Dany Acute Imake Value (g/kg)	Are value (g/kg)	Value (g/kg-day)	Value (g/kg)	(g/kg)	Adjustment	Adjustment	(g/kg)	Chron	Chronic TRV (g/kg)	Quotient	Quotient	Effect	Effect
Summer Engalpa/Poorting Incession	ting Ingestion													Ī	
	0000														
	900		9	1.1E-03		22	16	1600	1.1E+00		4E-02	8.8E-05	7.7E-02	2	2
	0000		60	5.3E-04			16	1600	1.1E+00		1.4E-02	4 4F-05		2 2	2
	0000		60	2.16-04	17.6			1600	1.1E+00		1.4E-02	1.86-05		2 2	2 2
	000/		90-	1.16-04				1600	1.1E+00		1.4E-02	8 8E.06	-	2 2	2 2
	0005		90	5.3E-05			16	1600	1.1E+00		1.4E-02	4 4F-06		2 2	2 2
	14300		90-	2.1E-05				1600	1,15+00		1.4E-02	1 AF. O.	1 55.03	2 2	2 2
	20000	9.7E-07	-07	1.16-05	17.6			1600	1.1E+00	-	1.4E-02	8 8E-07	7 75-04	2 2	2 2
100															
Acute crucal effects are weignt loss and lesions of the liver, spieen, and kidney. Ortical Stud	e weignt loss a	nd lesions of the li	ver, spieen, and k	Idney . Critical Study:	Bramachari 1958									T	
Chronic critical effect is gastrointestinal litration, Critical Study: Lewis 1989	s gastrointestir	al Irrtation, Critica	al Study: Lewis 19	689											
		· Sun a sun a													
		Intake Value	Chin Guidan			Chronic	Acute TRV	Chronic TRV	Acute			Acute	Chronic	I	
	(a)	minane value	Arra (mg	Dermaily absorbed	Acute Toxicity	Toxicity Value	Uncertainty	Uncertainty	T.			Hazard	Hezard	Acute	Chronic
			C III)	dose (g/kg-day)	Value (g/kg)	(g/kg)	Adjustment	Adjustment	(g/kg)	Chron	Chronic TRV (g/kg)	Quotient	Quotient	Effect	Effect
Summer Foraging/Roosting Dermal Absorption	ting Dermal Ab	sorption					1								
	4000	1.0E-02	2.2E-02	9.5E-04	2	216	4	9	10.0						
	2000	5.0E-03	2.2E-02	4.8E-04		216	2 4	3 9	1000	-	45+00	8.0E-02	7.1E-04	ş	Š
	0009	2.0E-03	2.2E-02	1 9E-04		346	2 9	200	1.30-01		1.4E+00	4.0E-02	3.5E-04	2	2
	7500	1.0E-03	2.2E-02	9.5E-05		940	2 9	001	1.35-01		1.4E+00	1.6E-02	1.45-04	No	Š
	9500		2.2E-02	4 RF.05		017	2 5	291	1.3E-01	+	1.4E+00	8.0E-03	7.1E-05	S	ટ
	14500		2.2E-02	1 95.05		910	9	180	1.3E-01	+	1.4E+00	4.0E-03	3.5E-05	ž	운
	20000		2.2E-02	0 AE-08		210	٩	160	1.3E-01	-	4E+00	1.6E-03	1.4E-05	Š	ş
			70	9.35-00	7	917	9	160	1.3E-01	+	4E+00	8.0E-04	7.1E-06	2	2
*Acute critical effect is slight to moderate skin irritation. Critical Study: Palmer 1990	aht to moderal	te skin Irritation	rifical Study. Daly	ner 1000											
*Chronic critical effects are well defined enthema and edema. Critical Study: 1 aude 1990	re well defined	l evithema and ed	ema Critical Struc	fur pards 4000										-	
				4. Editio 1909								-		-	
															Γ

Indiana bat risk characterization for fog oil exposure under Pasquill Category C.

. A.A.A.

						**************************************	Chronic	Acute TRV	Chronic TRV	Acute	40	Chronic Dose	Acute	Chronic		
Fig. 60 Fig.		Distance (m)	Dally Acute Intake		Value (g/kg-day)	Value (g/m²)	oxicity value (g/m³)	Uncertainty Adjustment	Oncertainty	(g/m³)	TRV (g/m³)	Adjusted TRV (g/kg-day)	HAZerd Quotlent	Quotient	Effect	Chronic
Column C																
Column	Winter Hibernation Inhs	lation													1	
Column C	Musgrave Hollow		200	2	4 45 00			45	150		1	2 15.07	A 2E 05	l	2	Ϋ́
Column C	DIO.		200.0		4 35 08			2 4	9	┸	1	2 45-07	5 3E-05		2 2	2
E-G (C) <td>red flow</td> <td></td> <td>2.0E-C</td> <td></td> <td>8.3F-09</td> <td></td> <td></td> <td>18</td> <td>160</td> <td>上</td> <td></td> <td>2.1E-07</td> <td>5.3E-05</td> <td></td> <td>2</td> <td>2</td>	red flow		2.0E-C		8.3F-09			18	160	上		2.1E-07	5.3E-05		2	2
Column C	1044		-30 x	2	3 4E-08			18	160	L		2 1E-07	1 35.04		Ž	N C
Column C	Bally McCann Hollow		1		20.40.0				-		1					
Color	Brooks		5.0E-0	40	8.3E-09	9		16	160			2.1E-07	1.3E-04		ટ	SN N
Fig. Color	Davis #2		1.0E-C	22	6.7E-07	9		16	160		ł	2.15-07	2.7E-03	L	2	Yes
Secondary Seco	Wolf Den	L	1.06-0	33	4.5E-08	9		16	160	L		2.15-07	2.7E-04		શ્	S
Fig. Fig.	loc.		1.06-0	25	5.3E-07	9		16	160			2.1E-07	2.7E-03		No	Yes
Fig. 1992 Fig. 199 Fig. 199 SER-70 G.SEG-9 C.SEG-70 Fig. 199 SER-70 G.SEG-9 C.SEG-70 Fig. 199 SER-70 G.SEG-9 C.SEG-70 Fig. 199 SER-70 G.SEG-9 C.SEG-70 Fig. 199 SER-70 G.SEG-9 C.SEG-70 Fig. 199 SER-70 G.SEG-9 C.SEG-70 Fig. 199 SER-70 G.SEG-9 C.SEG-70 Fig. 199 SER-70 G.SEG-9 C.SEG-70 Fig. 199 SER-70 G.SEG-9 C.SEG-70 Fig. 199 SER-70 G.SEG-9 C.SEG-70 Fig. 199 SER-70 G.SEG-9 C.SEG-70 Fig. 199 SER-70 G.SEG-9 C.SEG-70 C.SEG-70 Fig. 199 SER-70 G.SEG-9 C.SEG-70 C.SEG-70 Fig. 199 SER-70 G.SEG-9 C.SEG-70 C.SEG-70 Fig. 199 SER-70 G.SEG-9 C.SEG-70 C.SEG-70 Fig. 199 SER-70 G.SEG-9 C.SEG-70 C.SEG-70 C.SEG-70 Fig. 199 SER-70 G.SEG-70 C.SEG-70 C.SEG-70 C.SEG-70 Fig. 199 SER-70 G.SEG-70 C.SEG	Mush Paddle Hollow															
E-07 600 0.1 16	Brooks		1.05-0	24	0.0E+00	9		16	160	3.8E+00	6.3E-04	2.1E-07	2.7E-05		Š	No
Fig. 1992 Chicago Ch	Davis #2		1.06-0	22	5.6E-07	9		16	160	3.8E+00		2.1E-07	2.7E-03		Š	Yes
E-07 E-07	Wolf Den		2.0E-0	4	5.2E-09	09		16	160	3.8E+00		2.1E-07	50-3E-05		S	No
Fig. 2, E-09 Col. Fig. 3, 2, E-04 Col. Co	or	L	1.0E-0	12	3.4E-07	9		16	160	3.8E+00		2.1E-07	2.7E-03		Ş	Yes
Fig. Fig.																
Fig. 1992 Section Se	1		2.0E-0	34	2.0E-09	09	0.1	16	160			2.1E-07			2	S
Fig. Fig.	Davis #2		1.05-0)4	0.0E+00	60	0.1	16	160	1		2.1E-07			2	Š
The first 1502 The first 150 3.85+00 6.35-04 2.15-07 2.75-05 0.05+00 No	Wolf Der		2.0E-0	24	4.5E-09	90	0.1	16	9	1	- 1	2.1E-07		-	2	ž
Fig. 2 Fig. 3 Fig. 4 F	or		1.0E-0	74	0.0E+00	60	0.1	16	160	_1	-	2.1E-07			ž	2
Value (g/kg) Toxicity Value Marrainty Toxicity Value (g/kg) Toxicity																
Value (g/kg)	*Acute critical effect is c	Il pneumonia.	Oritical Study: Shin		- 1	- 1										
Acute Toxicity Toxicity Value Toxicity Value Toxicity Toxicity Value Toxicity Toxicity Value Toxicity Value Toxicity Value Toxicity Value Toxicity Value Toxicity Value Toxicity Value Toxicity Value Toxicity Value Toxicity Toxicity Value Toxicity Value Toxicity Value Toxicity Value Toxicity Value Toxicity Toxicity Value Toxicity Toxicity Value Toxicity	"Chronic critical effects	are minor lesio	ns of the heart, live		1											
Acute Toxicity Toxicity Value Uncertainty Toxicity Value (gl/g) (gl/g) Adjustment Adjustment (gl/g) Chronic TRV (gl/g																
y) Value (g/kg) (g/kg) Adjustment Adjustment (g/kg) Chronic TRV (g/kg) Quotient Quotient Guotient Effect Eff		Distance		Skin Surface	Dedraste Vilamad	*Acute Toxicity	Texicity Value	Acute TRV Uncertainty	Chronic TRV Uncertainty	Acute TRV			Acute	Chronic	Acute	Chronic
Edw 2 216 16 16 13E-01 1.4E+00 8 0E-03 9 6E-05 No E-04 2 2.16 16 160 1.3E-01 1.4E+00 8 0E-03 9 6E-05 No E-04 2 2.16 16 160 1.3E-01 1.4E+00 8 0E-03 9.5E-05 No E-04 2 2.16 16 160 1.3E-01 1.4E+00 8 0E-03 9.5E-05 No E-04 2 2.16 16 160 1.3E-01 1.4E+00 8 0E-03 9.5E-05 No E-04 2 2.16 16 160 1.3E-01 1.4E+00 8 0E-03 9.5E-05 No E-04 2 2.16 16 1.3E-01 1.4E+00 8 0E-03 9.5E-05 No E-04 2 2.16 16 1.3E-01 1.4E+00 8 0E-03 9.5E-05 No E-04 2 2.16 16 1.3E-01 1.4E+00		(E)		Area (m²)	dose (g/kg-day)	Value (g/kg)	(0/kg)	Adjustment	Adjustment	(g/kg)	Chron	c TRV (g/kg)	Quotient	Quotient	Effect	Effect
Edd 2 216 16 160 13E-01 1.4E+00 8.0E-03 9.5E-05 No Edd 2 216 16 160 1.3E-01 1.4E+00 8.0E-03 9.5E-05 No Edd 2 216 16 160 1.3E-01 1.4E+00 8.0E-03 9.5E-05 No Edd 2 216 16 1.3E-01 1.4E+00 8.0E-03 9.5E-05 No Edd 2 216 16 1.3E-01 1.4E+00 8.0E-03 9.5E-05 No E-04 2 2.16 16 1.3E-01 1.4E+00 8.0E-03 3.5E-05 No E-04 2 2.16 16 1.3E-01 1.4E+00 8.0E-03 3.5E-05 No E-04 2 2.16 16 1.3E-01 1.4E+00 8.0E-03 3.5E-05 No E-05 2 2.16 16 1.3E-01 1.4E+00 8.0E-03 3.5E-04 No																
EQ4 2 216 16 160 1.3E-01 1.4E+00 8.0E-03 9.5E-05 No E-04 2 2.16 16 1.3E-01 1.4E+00 8.0E-03 9.5E-05 No E-04 2 2.16 16 1.3E-01 1.4E+00 8.0E-03 9.5E-05 No E-04 2 2.16 16 1.3E-01 1.4E+00 8.0E-03 9.5E-05 No E-04 2 2.16 16 1.3E-01 1.4E+00 8.0E-03 7.1E-05 No E-04 2 2.16 16 1.3E-01 1.4E+00 8.0E-03 7.1E-04 No E-04 2 2.16 16 1.3E-01 1.4E+00 8.0E-03 7.1E-04 No E-04 2 2.16 16 1.3E-01 1.4E+00 8.0E-03 7.1E-04 No E-05 2 2.16 16 1.3E-01 1.4E+00 8.0E-03 7.1E-04 No E-05 </td <td>Winter Hibernation Den</td> <td>nal Absorption</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	Winter Hibernation Den	nal Absorption														
E-04 2 216 16 160 13E-01 14E+00 8 0E-03 9 5E-05 No E-04 2 216 16 160 13E-01 14E+00 8 0E-03 9 5E-05 No E-04 2 216 16 160 13E-01 14E+00 8 0E-03 9 5E-05 No E-04 2 216 16 160 13E-01 14E+00 8 0E-03 3 5E-05 No E-04 2 216 16 160 13E-01 14E+00 8 0E-03 7 1E-04 No E-04 2 216 16 160 13E-01 14E+00 8 0E-03 7 1E-04 No E-04 2 216 16 160 13E-01 14E+00 8 0E-03 3 0E-05 No E-05 2 216 16 13E-01 14E+00 8 0E-03 3 0E-05 No E-04 2 216 16 13E-01 14E+00	Musgrave Hollow														-	
E-04 2 216 16 18E-01 1.4E+00 4.0E-03 4.7E-05 No E-05 2 216 16 160 1.3E-01 1.4E+00 4.0E-03 4.7E-05 No E-04 2 2.16 16 160 1.3E-01 1.4E+00 8.0E-03 3.5E-04 No E-04 2 2.16 16 160 1.3E-01 1.4E+00 8.0E-02 7.1E-05 No E-04 2 2.16 16 160 1.3E-01 1.4E+00 8.0E-02 7.1E-05 No E-04 2 2.16 16 160 1.3E-01 1.4E+00 8.0E-02 7.1E-04 No E-04 2 2.16 16 160 1.3E-01 1.4E+00 8.0E-02 7.1E-04 No E-04 2 2.16 16 160 1.3E-01 1.4E+00 8.0E-02 7.1E-04 No E-04 2 2.16 16 160 <td< td=""><td>Brooks</td><td></td><td>1.05-03</td><td>2.2E-02</td><td>1.36-04</td><td></td><td></td><td>16</td><td>160</td><td>⅃</td><td></td><td>.4E+00</td><td>8.0E-03</td><td></td><td>ટ</td><td>2</td></td<>	Brooks		1.05-03	2.2E-02	1.36-04			16	160	⅃		.4E+00	8.0E-03		ટ	2
E-05 2 216 16 160 13E-01 1.4E+00 4.0E-03 9.7E-05 No E-04 2 216 16 160 1.3E-01 1.4E+00 8.0E-03 9.7E-05 No E-05 2 216 16 160 1.3E-01 1.4E+00 8.0E-03 7.1E-05 No E-04 2 216 16 160 1.3E-01 1.4E+00 8.0E-03 7.1E-04 No E-04 2 216 16 160 1.3E-01 1.4E+00 8.0E-02 7.1E-04 No E-04 2 216 16 1.3E-01 1.4E+00 8.0E-02 7.1E-04 No E-05 2 216 16 1.3E-01 1.4E+00 8.0E-03 3.0E-05 No E-04 2 2.16 16 1.3E-01 1.4E+00 8.0E-03 5.9E-04 No E-05 2 2.16 16 1.60 1.3E-01 1.4E+00	Zavis #		1.0E-03	2.2E-02	1.3E-04			16	9	\perp		4E+00	8.0E-03		2	S
E-04 2 216 16 160 13E-01 1.4E+00 8.0E-03 7.1E-05 No E-04 2 2.16 16 160 1.3E-01 1.4E+00 8.0E-03 7.1E-04 No E-04 2 2.16 16 160 1.3E-01 1.4E+00 8.0E-02 7.1E-04 No E-04 2 2.16 16 160 1.3E-01 1.4E+00 8.0E-02 7.1E-04 No E-05 2 2.16 16 160 1.3E-01 1.4E+00 8.0E-02 7.1E-04 No E-05 2 2.16 16 160 1.3E-01 1.4E+00 8.0E-02 7.1E-04 No E-05 2 2.16 16 1.3E-01 1.4E+00 8.0E-02 7.1E-04 No E-05 2 2.16 16 1.3E-01 1.4E+00 8.0E-02 7.1E-04 No E-05 2 2.16 16 1.3E-01 1.4E+00	Wolf Der		5.0E-04	2.2E-02	6.4E-05			16	160	┙		.4E+00	4.0E-03		o Z	2
E.04 2 216 16 160 13E-01 1.4E+00 8.0E-02 7.1E-04 No E.04 2 216 16 160 13E-01 1.4E+00 8.0E-02 7.1E-04 No E.04 2 216 16 160 13E-01 1.4E+00 4.0E-02 7.1E-04 No E-05 2 216 16 160 13E-01 1.4E+00 8.0E-02 7.1E-04 No E-05 2 216 16 160 13E-01 1.4E+00 8.0E-02 7.1E-04 No E-05 2 216 16 160 1.3E-01 1.4E+00 8.0E-02 7.1E-04 No E-05 2 2.16 16 160 1.3E-01 1.4E+00 8.0E-03 3.0E-05 No E-05 2 2.16 16 160 1.3E-01 1.4E+00 8.0E-03 4.7E-05 No E-05 2 2.16 16 160 <td>or</td> <td></td> <td>1.0E-03</td> <td>2.2E-02</td> <td>1.3E-04</td> <td></td> <td></td> <td>16</td> <td>160</td> <td>ユ</td> <td>,</td> <td>.4E+00</td> <td>8.0E-03</td> <td>9.5E-05</td> <td>2</td> <td>ž</td>	or		1.0E-03	2.2E-02	1.3E-04			16	160	ユ	,	.4E+00	8.0E-03	9.5E-05	2	ž
E-05	Bally McCann Hollow			1				,		1			20.00			
E.04 2 2 tb 10 1.3E-01 1.4E+00 4.0E-02 3.6E-04 No E.04 2 2.16 16 160 1.3E-01 1.4E+00 4.0E-02 3.6E-04 No E-05 2 2.16 16 160 1.3E-01 1.4E+00 8.0E-02 7.1E-04 No E-05 2 2.16 16 160 1.3E-01 1.4E+00 8.0E-03 5.9E-04 No E-04 2 2.16 16 1.3E-01 1.4E+00 8.0E-03 5.9E-04 No E-05 2 2.16 16 1.3E-01 1.4E+00 8.0E-02 5.9E-04 No E-05 2 2.16 16 1.3E-01 1.4E+00 8.0E-02 5.9E-04 No E-05 2 2.16 16 1.3E-01 1.4E+00 8.0E-02 5.9E-04 No E-05 2 2.16 16 1.3E-01 1.4E+00 8.0E-02 5.9E-04 N	Brook		1.05-03	2.2E-02	9.00-00			0 9	001	1		-45±00	0.00		2 :	2
Color	Davis #.		1.0E-02	2.25-02	8.0E-04			10	160	ı		45+00	8.UE-UZ		2 2	2 2
Formal	Work Det		20.00-03	2.25-02	4.0E-04			9	001	1		80.0	4.05-02		2 :	2
E-05 2 216 16 160 1,3E-01 1,4E+00 4,0E-03 3,0E-05 No E-04 2 216 16 160 1,3E-01 1,4E+00 8,0E-02 5,9E-04 No E-05 2 216 16 160 1,3E-01 1,4E+00 8,0E-02 5,9E-04 No E-05 2 216 16 160 1,3E-01 1,4E+00 8,0E-03 5,9E-04 No E-05 2 216 16 160 1,3E-01 1,4E+00 8,0E-03 4,7E-05 No E-05 2 216 16 160 1,3E-01 1,4E+00 1,6E-03 4,7E-05 No E-05 2 216 16 160 1,3E-01 1,4E+00 1,6E-03 4,7E-05 No E-05 2 216 16 160 1,3E-01 1,4E+00 1,6E-03 4,7E-05 No E-05 2 2 16 16	9		7.0E-02	2.2E-02	8.0E-04			01	naı	┸		.4C+00	0.0E-02		2	2
EOA 2 216 16 160 13E-01 1.4E+00 8.0E-02 5.9E-04 No EOA 2 216 16 160 1.3E-01 1.4E+00 8.0E-02 5.9E-04 No EOA 2 216 16 160 1.3E-01 1.4E+00 8.0E-02 5.9E-04 No EOA 2 216 16 160 1.3E-01 1.4E+00 8.0E-03 4.7E-05 No EOA 2 216 16 160 1.3E-01 1.4E+00 8.0E-03 4.7E-05 No EOA 2 216 16 160 1.3E-01 1.4E+00 8.0E-03 4.7E-05 No EOA 2 216 16 160 1.3E-01 1.4E+00 8.0E-03 4.7E-05 No EOA 2 216 16 160 1.3E-01 1.4E+00 8.0E-03 9.5E-06 No	Mush Paggie Hollow		F OF 04	2.25.02	4 05 05			4	150	L		4F±00	4 0E-03		2	52
E-05 2 216 16 160 13E-01 1.4E+00 8.0E-03 5.9E-05 No E-04 2 216 16 160 1.3E-01 1.4E+00 8.0E-02 5.9E-04 No E-05 2 216 16 160 1.3E-01 1.4E+00 8.0E-02 5.9E-04 No E-05 2 216 16 160 1.3E-01 1.4E+00 8.0E-03 4.7E-05 No E-05 2 216 16 160 1.3E-01 1.4E+00 8.0E-03 4.7E-05 No E-05 2 216 16 160 1.3E-01 1.4E+00 1.6E-03 9.5E-06 No	Direct Contract of the Contrac		4 OF 02	2.2E-02	AOFOA			5 8	9	L		4F+00	8 OF 02		2 2	2 2
E.04 2 216 16 160 1.3E-01 1.4E+00 8.0E-02 5.9E-04 No E.05 2 2.16 16 150 1.3E-01 1.4E+00 8.0E-03 5.9E-04 No E.05 2 2.16 16 150 1.3E-01 1.4E+00 8.0E-03 5.5E-06 No E.05 2 2.16 16 150 1.3E-01 1.4E+00 8.0E-03 9.5E-06 No E.05 2 2.16 16 150 1.3E-01 1.4E+00 1.6E-03 9.5E-06 No	A CAPA		20 00 4	2 25 02	40-10.0			2 4	460	L		4F±00	B OF OR		2	2
E-05 2 216 16 160 1.3E-01 1.4E+00 8.0E-03 4.7E-05 No E-05 2 2.16 16 160 1.3E-01 1.4E+00 8.0E-03 4.7E-05 No E-05 2 2.16 16 160 1.3E-01 1.4E+00 8.0E-03 4.7E-05 No E-05 2 2.16 16 160 1.3E-01 1.4E+00 8.0E-03 4.7E-05 No E-05 2 2.16 16 160 1.3E-01 1.4E+00 1.6E-03 9.5E-06 No	אסוו מא		4 OF 02	2.2E-02	A OF OA			45	9	L		4F±00	8.0E-02	Ì	2	2
E-05 2 216 16 150 1.3E-01 1.4E+00 8.0E-03 4.7E-05 No E-05 2 216 16 160 1.3E-01 1.4E+00 1.6E-03 9.5E-06 No E-05 2 216 16 160 1.3E-01 1.4E+00 8.0E-03 4.7E-05 No E-05 2 216 16 160 1.3E-01 1.4E+00 1.6E-03 9.5E-06 No	1		70.70	10.1				2		L		20.00	20.5			
E-05 2 216 16 160 13E-01 1.4E+00 1.6E-03 9.5E-06 No E-05 2 216 16 160 1.3E-01 1.4E+00 8.0E-03 4.7E-05 No E-05 2 216 16 160 1.3E-01 1.4E+00 1.6E-03 9.5E-06 No	1		1.0E-03	2.2E-02	6.4E-05			16	160			.4E+00	8.0E-03		2	S
E-05 2 216 16 150 1.3E-01 1.4E+00 8.0E-03 4.7E-05 No E-05 2 216 16 150 1.3E-01 1.4E+00 1.6E-03 9.5E-06 No E-05 2 216 16 150 1.3E-01 1.4E+00 1.6E-03 9.5E-06 No E-05 2 216 16 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Davis #	L	2.0E-04	2.2E-02	1.3E-05			16	160			4E+00	1.6E-03		2	2
E-05 2 216 16 150 1.3E-01 1.4E+00 1.6E-03 9.5E-06 No	Wolf Der		1.0E-03	2.2E-02	6.4E-05			16	160	L		4E+00	8.0E-03		2	2
	or		2.0E-04	2.2E-02	1.3E-05			16	160	L		4E+00	1.6E-03		2	2
*Acute critical effect is slight to moderate skin Irritation. Critical Study: Palmer 1990 **Chronic critical effects are well defined erythems and edema. Critical Study: Lewis 1999										L						
"Chronic critical effects are well defined erythema and edema. Critical Study: Lewis 1989	*Acute critical effect is a	light to modera	te skin Irritation. Cr	itical Study: Pal	mer 1990											
The state of the s	"Chank critical offects	are well define	d erythema and ed	ema. Critical St.	udv: Lewis 1989											

Indiana bat risk characterization for fog oil exposure under Pasquill Category C.

Mobile Smoke		,													
	Distance			1 1 2 2 3		Caronic	Acute TRV	Chronic TRV	ACUTO		Chronic Dose	Acute	Chronic	•	
	Έ)	Dally Acute Intake Value (g/m³)	ke Value (g/m³)	Value (g/kg-day)	Value (g/m²)	(a/m²)	Uncertainty	Uncertainty	TRV	Chronic TBV (a(m³).	Adjusted TRV	Hazard	Hazard	Acute	Chronic
										1	(Sv8-Oay)	Cuotient	Quotient	Effect	Effect
Summer Foraging/Roosting Inhalation	osting inhalation														
	3000	1.0E-02	-02	1.5E-06		0.1	35	180	2 00.100	0 35 0	100				
	3000	5.0E-03	-03	7.6E-07			4	9	200	0.35-04	7.15-07			ş	Yes
	3000		-03	3 0F.07			2 9	200	300	0.3E-04	2.1E-07		1		Yes
	4500		-03	1 55.07			10		3.8E+00	1	2.1E-07				×es
	6500		200	7.55.0	8 8		91	160	3.8E+00		2.1E-07				2
	9500		200	00-20.			16		3.8E+00	- [2.1E-07		3.6E-01		2
	14000		5 6	3.05-08		0.1	16	160	3.8E+00	i	2.15-07	5.3E-05			Š
	2001		5	1.55-08	9	0.4	16	160	3.8E+00	6.3E-04	2.15-07	2.7E-05		2	Ž
*Acute critical effect is oil oneumonia Critical Study. Shipp et al. 1987	oi preumonia	Critical Study Shi	100 le te no												
		C. C. C. C.	1001 al. 1307												
Chronic cracal enects are minor lesions of the heart, liver and lungs.	ts are minor lesk	ons of the heart, Ilv	er and lungs. Co	Critical Study: Driver et a	al. 1992										
						"Chronic	Acute TRV	Chronic TRV	ACUIT.						
	Distance			Dally Chronic Intake	*Acute Toxicity	Toxicity Value	Uncertainty	Ilneadalph	200			Acute	ייים		
	Ē	Daily Acute Intake Value (g/kg)	ke Value (o/kg)	Value (o/kg-dav)		(after)	Adhintment	A distribution	À :	i		Hazard	Hazard	Acute	Chronic
					(Aug)	(Rush)	Adjustment	Adjustment	(g/kg)	Chron	Chronic TRV (g/kg)	Quotient	Quotient	Effect	Effect
Summer Foraging/Roosting Ingestion	sting Ingestion														
	3000	AC 27. 0	95	46.27											
	2007		3 3	1.15.03		22	16	1600	1.15+00	-	1.4E-02	8.8E-05	7.7E-02	Ş	Ž
	200		2	3.35-04		22	. 16	1600	1.1E+00	-	4E-02	4 4F.05	3 8F.02	2	2
	0000		8	2.15-04		22	16	1600	1.1E+00		1.4E-02	1 AF OS	4 50.00	2 2	2 4
	Once		9	1.16-04		22	16	1600	1.1E+00		4F-02	A PE A	7 75 03		2
	12000		99	5.3E-05		22	16	1600	1.1E+00		1 4F-02	4 45.06	2 85 03	2 :	2
	74000		90-	2.1E-05	17.6	22	16	1600	1 15+00		1 4E 00	20 10	3 2	2	2
	40000	9.7E-07	-07	1.15-05		22	2	1800	3	֓֟֟֓֓֟֟֓֓֓֓֓֓֓֟֓֓֓֓֟֓֓֓֓֟֓֓֓֓֓֓֓֓֓֓֓֟֓֓֓֓	4 45 00	20-10-	1.0=03	Ž	Š
								200	3		70-24	8.8E-07	7.7E-04	£	ž
"Acute critical effects are weight loss and lesions of the liver, spleen, and kidney.	re weight loss ar	nd lesions of the liv	er, spleen, and k	Critical Study:	Bramachari 1958				\dagger			,			
"Chronic critical effect	is gastrointestin.	al irritation. Critica	1 Study: Lewis 15												
		Daily Acute				a Change									
	Distance	Intake Value	Skin Surface	Danmally of any			ACOID I	Caronic 18V	Acute			Acute	Chronic		
	E		Aces (m2)	Decined with the parties of the part	Acute loxicity	Toxicity Value	Uncertainty	Uncertainty	787			Hazard	Hazard	Acute	Chronic
		T	Vice (III)	cose (g/kg-day)	Value (g/kg)	(9/kg)	Adjustment	Adjustment	(g/kg)	Chronic	Chronic TRV (g/kg)	Quotient	Quotient	Effect	Effect
Summer Foracing/Roceting Dermal Absorption	effor Dermal Abs	rotation													
CONTRACT CONTRACT	3000	4 05 00	20 70 0												
	200	20-00-1		9.0E-04		216	16	160	1.3E-01	-	1.4E+00	8 OF-02	7 1E-04	2	No
	0007	3.0E-03	2.2E-02	4.8E-04		216	16	160	1.3E-01	-	1.4E+00	4 OF-02	205	2 2	2 2
	0000	2.0E-U3	2.2E-02	1.9E-04		216	16	160	1.3E-01	-	1.4E+00	1 SE-02	70 27		2
	Once		2.2E-02	9.5E-05	2	216	9	160	1 3E-01		4 45100	100	2	02	2
	12000		2.2E-02	4.8E-05	2	216	4	29	1000		2010	8.0E-03	7.1E-05	Š	£
	24000	2.0E-04	2 2E-02	1.95-05		218	2 9	201	10-10		1.45+00	4.0E-03	3.55-05	No	Š
	40000	1.0E-04	2.2F-02	9 55.08		017	2	190	1.3E-01	+	1.4E+00	1.6E-03	1.4E-05	o _N	2
				20.5		017	2	160	1.3E-01	+	1.4E+00	8.0E-04	7.1E-06	Š	2
*Acute critical effect is slight to moderate skin irritation. Critical Study: Palmer 1990	flight to moderat	e skin irritation Cr	rical Study Pal	mer 1990											
*Chronic critical effects are well defined enthems and edema Critical Children and	are well defined	1 erythema and ed	ema Critical Ct.	July 1990											
		o o de la constante de la cons	Pelila. Crifical Off	Juy. Lewis 1969											
										 			†	\dagger	T
													_	_	

Indiana bat risk characterization for fog oil exposure under Pasquill Category D.

Chronic TRV Chronic TRV							Chronic	Acute TRV	Chronic TRV	Acute		Chronic Dose	Acute	Chronic		
Majustiment Adjustiment		Distance					Toxicity Value	Uncertainty	Uncertainty	TRV	Chronic	Adjusted TRV	Hazard	Hazard	Acute	Chronic
E-08 60 0.1 16 160 3.8E+00 6. E-08 60 0.1 16 160 3.8E+00 6. E-08 60 0.1 16 160 3.8E+00 6. E-08 60 0.1 16 160 3.8E+00 6. E-08 60 0.1 16 160 3.8E+00 6. E-09 60 0.1 16 160 3.8E+00 6. E-09 60 0.1 16 160 3.8E+00 6. E-09 60 0.1 16 160 3.8E+00 6. E-09 60 0.1 16 160 3.8E+00 6. E-09 60 0.1 16 160 3.8E+00 6. E-09 60 0.1 16 160 3.8E+00 6. E-09 60 0.1 16 160 3.8E+00 6. E-09 60 0.1 16 160 3.8E+00 6. E-09 60 0.1 16 160 3.8E+00 6. E-09 60 0.1 16 160 3.8E+00 6. E-09 60 0.1 16 160 3.8E+00 6. E-09 60 0.1 16 160 3.8E+00 6. E-09 60 0.1 16 160 3.8E+00 6. E-09 60 0.1 16 160 3.8E+00 6. E-09 60 0.1 16 160 3.8E+00 6. E-09 60 0.1 16 160 3.8E+00 6. E-09 60 0.1 16 160 13.E-01 6. E-09 60 0.1 16 160 13.E-01 6. E-09 60 0.1 16 160 13.E-01 6. E-09 60 60 60 60 13.E-01 6. E-09 60 60 60 13.E-01 6. E-09 60 60 60 13.E-01 6. E-09 60 60 13.E-01 6. E-09 60 13.E-01 6. E		Ê	Daily Acute Intak	e Value (g/m²)	Value (g/kg-day)	Value (g/m³)	(g/m²)	Adjustment	Adjustment	(a/m²)	TRV (g/m³)	(g/kg-day)	Quotient	Quotient	Effect	Effect
E-08 60 0.1 16 160 3.8E+00 6. E-08 60 0.1 16 160 3.8E+00 6. E-09 7.8E+00																
Fig. Fig.	Winter Hibernation Innai	uoge														
Fig. 60	Brooks	8031		7	1.0E-08				160	ㅗ	1	2.1E-07			2	2
E-04 60 0.1 16 160 3.6E+00 6. E-05 60 0.1 16 160 3.6E+00 6. E-06 60 0.1 16 160 3.6E+00 6. E-07 60 0.1 16 160 3.6E+00 6. E-08 60 0.1 16 160 3.6E+00 6. E-09 60 0.1 16 160 3.6E+00 6. E-09 60 0.1 16 160 3.6E+00 6. E-09 60 0.1 16 160 3.6E+00 6. E-09 60 0.1 16 160 3.6E+00 6. E-09 60 0.1 16 160 3.6E+00 6. E-09 60 0.1 16 160 3.6E+00 6. E-09 60 0.1 16 160 3.6E+00 6. E-09 60 0.1 16 160 3.6E+00 6. E-09 60 0.1 16 160 3.6E+00 6. E-09 60 0.1 16 160 3.6E+00 6. E-09 60 0.1 16 160 3.6E+00 6. E-09 60 0.1 16 160 3.6E+00 6. E-09 60 0.1 16 160 3.6E+00 6. E-09 60 0.1 16 160 3.6E+00 6. E-09 60 0.1 16 160 3.6E+00 6. E-09 60 0.1 16 160 3.6E+00 6. E-09 7.0E+00 7.0E+00 7.0E+00 6. E-09 7.0E+00 7.0E+00 7.0E+00 7.0E+00 6. E-09 7.0E+00 7.0	Davis #2	6624		¥	3.2E-08				9	L		2.1E-07			ž	Š
E-04 60 0.1 16 160 3.8E+00 6. E-05 60 0.1 16 160 3.8E+00 6. E-06 60 0.1 16 160 3.8E+00 6. E-07 60 0.1 16 160 3.8E+00 6. E-07 60 0.1 16 160 3.8E+00 6. E-08 60 0.1 16 160 3.8E+00 6. E-09 60 0.1 16 160 3.8E+00 6. E-09 60 0.1 16 160 3.8E+00 6. E-09 60 0.1 16 160 3.8E+00 6. E-09 60 0.1 16 160 3.8E+00 6. E-09 60 0.1 16 160 3.8E+00 6. E-09 60 0.1 16 160 3.8E+00 6. E-09 60 0.1 16 160 3.8E+00 6. E-09 60 0.1 16 160 3.8E+00 6. E-09 60 0.1 16 160 3.8E+00 6. E-09 60 0.1 16 160 3.8E+00 6. E-09 60 0.1 16 160 3.8E+00 6. E-09 60 0.1 16 160 3.8E+00 6. E-09 60 0.1 16 160 3.8E+00 6. E-09 60 0.1 16 160 3.8E+00 6. E-09 60 0.1 16 160 3.8E+00 6. E-09 7.4Iue (g/kg) (g/kg) 4.0Iue	Wolf Den	8609		7	2.15-08				160	L	l	2.1E-07	_		2	2
E-04 60 0.1 16 160 3.8E+00 6. E-07 60 0.1 16 160 3.8E+00 6. E-08 60 0.1 16 160 3.8E+00 6. E-09 60 0.1 16 160 3.8E+00 6. E-09 60 0.1 16 160 3.8E+00 6. E-09 60 0.1 16 160 3.8E+00 6. E-09 60 0.1 16 160 3.8E+00 6. E-09 60 0.1 16 160 3.8E+00 6. E-09 60 0.1 16 160 3.8E+00 6. E-09 0.1 16 160 3.8E+00 6. E-09 0.1 16 160 3.8E+00 6. E-09 60 0.1 16 160 3.8E+00 6. E-09 60 0.1 </td <td>Joy</td> <td>5447</td> <td></td> <td>33</td> <td>7.0E-08</td> <td></td> <td></td> <td></td> <td>160</td> <td>Ш</td> <td> </td> <td>2.15-07</td> <td>2.7E-04</td> <td>3.35-01</td> <td>ž</td> <td>2</td>	Joy	5447		33	7.0E-08				160	Ш		2.15-07	2.7E-04	3.35-01	ž	2
E-0.6 60 0.1 16 160 3.8E+00 6.	Bally McCann Hollow															
E-07 60	Brooks			33	1.7E-08		0.1	16	160		-	2.1E-07			ž	Ş
E-08 E-09 E-08 E-09	Davis #2			32	6.7E-07		0.1		160		ı	2.1E-07	2.7E-03	3.2E+00	ž	×68
E-07 60	Wolf Den	3861		73	9.15-08		0.1		3		-	2.15-07		١	Ş	ž
E-07 60 0.1 16 160 3.8E+00 6.	yor	2004		72	5.3E-07		0.1		160	L	1	2.1E-07		1	운	×68
E-07 E-08 O	Mush Paddle Hollow										-					
E-04 60 0.1 16 160 3.8E+00 6.	Brooks	10335		74	0.0E+00		0.1	9	160	3.8E+00	Į	2.16-07			Š	2
Fe-06 Fe-07 Fe-08 Fe-09 Fe-0	Davis #2	2889		25	5.6E-07		0.1	16	160	3.8E+00	1	2.1E-07	2.7E-03	2.7E+00	2	× S
E-09 60 0.1 16 160 3.8E+00 6.	Wolf Den	6432		24	1.35-08		1.0	9 9	160	3.8E+00	1	2.15-07	╛		2	2 :
E-09 E-00 0.1 16 160 3.8E+00 6.	١	16/1	1.0E-1	77	3.4E-07		L.O	2	160	3.85+00	1	2.1E-07	1		Ş	\$6
Fig. 60	Ų	0110			00 27 9			9	007	<u>_</u> L	1	10 110				
Feb	Brooks	6440		4	9.15-09		0.1	2	3			2.1E-0/			Ŝ.	Š
February February	Z# SIARC	13352		4	0.05+00		100		091			2.1E-07	5.3E-05		2	2
Fried (1992	Wor Den	1000			1.15-08		1.0		001	_	1	2.15-07		5.3E-02	2	2
Part of all to be a content of a content o	AOC.	13071	7.0E-1	•	0.00		5		282	_L	1	Z.1E-07			ę	Ş
Yelue (9/kg) Yelu	in al traffic leading attende	cinomisen	Critical Chinder China	1404 1047											1	
Figure F	Acute critical estect to our	pricontorina.	onical otday. Office	20d hann Cri	Sand Children Dakes at a	4000									1	
bed (a)/(a) **Chronic Acute TRV (a)/(b) Adjustment (a)/(b) Acute Toxicity (a)/(b) Adjustment (a)/(b) Acute Toxicity (a)/(b) <	Curonic craical errects	II O IIII III III	חוז מו נוום וומפור, וועם	and lungs. Cit	tical Study. Utiver et a	1, 1992									1	
bad Acute Toxicity Toxicity Value Currantality Currantality Currantality Currantality TRV by) Value (g/kg) (g/kg) Adjustment Adjustment (g/kg) TRV E-04 2 216 16 16 16 13E-01 E-04 2 216 16 16 13E-01 E-04 2 216 16 160 13E-01 E-04 2 216 16 160 13E-01 E-04 2 216 16 160 13E-01 E-04 2 216 16 160 13E-01 E-04 2 216 16 160 13E-01 E-04 2 216 16 160 13E-01 E-04 2 216 16 160 13E-01 E-04 2 216 16 160 13E-01 E-04 2 216 16 160 13			THE RELIEF	1			2000		1100							
Value (g/kg) (g/kg) Adjustment Adjustment (g/kg) E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 1.3E-01 E-04 2 216 16 1.3E-01 E-04 2 216 16 1.3E-01 E-04 2 216 16 1.3E-01 E-04 2 216 16 1.3E-01 E-04 2 216 16 1.3E-01 E-04 2 216 16 1.60 1.3E-01 E-04 2 216 16 1.60 1.3E-01 E-04 2 216 16 1		Distance		skin Surface	Dermaily absorbed	*Acute Toxicity	Toxicity Value	Uncertainty	Uncertainty	TRV			Hazard	Hazard	Acute	Chronic
E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 </th <th></th> <th>Ē</th> <th></th> <th>Area (m²)</th> <th>dose (g/kg-day)</th> <th>Value (g/kg)</th> <th>(a/kg)</th> <th>Adjustment</th> <th>Adjustment</th> <th>(g/kg)</th> <th>Chron</th> <th>Chronic TRV (g/kg)</th> <th>Quotlent</th> <th>Quotlent</th> <th>Effect</th> <th>Effect</th>		Ē		Area (m²)	dose (g/kg-day)	Value (g/kg)	(a/kg)	Adjustment	Adjustment	(g/kg)	Chron	Chronic TRV (g/kg)	Quotlent	Quotlent	Effect	Effect
E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>																
E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 </td <td>Winter Ribernation Definition</td> <td>ADSOLDING!</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	Winter Ribernation Definition	ADSOLDING!														
E-04 2 216 16 160 13E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 <td>Musulave nomon</td> <td>8034</td> <td></td> <td>2.2E.02</td> <td>6.4E-04</td> <td></td> <td>216</td> <td></td> <td>160</td> <td>1</td> <td> </td> <td>45+00</td> <td>7 00 00</td> <td>1 76 04</td> <td>1</td> <td>1</td>	Musulave nomon	8034		2.2E.02	6.4E-04		216		160	1	 	45+00	7 00 00	1 76 04	1	1
E-04 2 216 16 160 13E-01 E-04 2 216 16 160 13E-01 E-04 2 216 16 160 13E-01 E-04 2 216 16 160 13E-01 E-04 2 216 16 160 13E-01 E-04 2 216 16 160 13E-01 E-04 2 216 16 160 13E-01 E-04 2 216 16 160 13E-01 E-04 2 216 16 160 13E-01 E-04 2 216 16 160 13E-01 E-04 2 216 16 160 13E-01 E-04 2 216 16 160 13E-01 E-04 2 216 16 160 13E-01 E-04 2 216 16 160 13E-01	Chavie #2	6624		2 2E-02	R 4E.04		218		9	1		20.00	105.00		2	2 2
E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 </td <td>Wolf Den</td> <td>8609</td> <td></td> <td>2 2E-02</td> <td>2.6E-04</td> <td></td> <td>216</td> <td></td> <td>160</td> <td></td> <td> </td> <td>4F±00</td> <td>1 65.02</td> <td></td> <td>2 2</td> <td>2 2</td>	Wolf Den	8609		2 2E-02	2.6E-04		216		160			4F±00	1 65.02		2 2	2 2
E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 </td <td>yor</td> <td>5447</td> <td></td> <td>2.2E-02</td> <td>1.3E-03</td> <td></td> <td>216</td> <td></td> <td>160</td> <td>1</td> <td></td> <td>4E+00</td> <td>8 OF-02</td> <td>9.5F-04</td> <td>2 2</td> <td>2</td>	yor	5447		2.2E-02	1.3E-03		216		160	1		4E+00	8 OF-02	9.5F-04	2 2	2
E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01	Bally McCann Hollow										_					
E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 16 1.3E-01 E-04 2 216 16 16 1.3E-01 E-04 2 216 16 16 1.3E-01 E-04 2 216 16 16 1.3E-01 E-04 2 216 16 16 1.3E-01 E-05 25 25 25 25 25 25 E-05 25 25 25 25 25 25 25 E-05 25 25 25 25 25	Brooks	5803		2.2E-02	9.6E-04		216.		160	1.3E-01	-	4E+00	8.0E-02		ટ	ž
E-04 2 216 16 160 1.3E-01 E-04 2 216 16 16 1.3E-01 E-04 2 216 16 16 1.3E-01 E-04 2 216 16 16 1.3E-01 E-04 2 216 16 16 1.3E-01 E-04 2 216 16 16 1.3E-01 E-04 2 216 16 16 1.3E-01 E-04 2 216 16 16 1.3E-01 E-04 2 216 16 16 1.3E-01 E-04 2 216 16 16 1.3E-01 E-04 2 216 16 16 1.3E-01	Davis #2	2423		2.2E-02	9.6E-04		216		160	1.3E-01	+	4E+00	8.0E-02	ļ	ş	S
E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01	Wolf Den	3861		2.2E-02	9.6E-04		216		160	1.35-01		4E+00	8.0E-02	7.1E-04	2	2
E-04 2 216 16 160 1.3E-01 1 E-04 2 216 16 160 1.3E-01 1 E-04 2 216 16 160 1.3E-01 1 E-04 2 216 16 160 1.3E-01 1 E-04 2 216 16 160 1.3E-01 1 E-04 2 216 16 160 1.3E-01 1 E-04 2 216 16 160 1.3E-01 1	you.	2004	1.0E-02	Z.ZE-0Z	9.6E-04		216		160	1.3E-01	-	4E+00	8.0E-02	7.1E-04	£	ž
E-04 2 216 16 160 1.3E-01 1	Mush Paddle Hollow	10335		2 25 02	+ 65.04		346	4	001	4 25		00,14	10.10			
E-04 2 216 16 160 1.3E-01 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	C# elve	2880		2 25 02	AO 00 0		310		99,	1.000		00:10	1.05-02		2	2
E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01	A SING	2002		2 25 02	40-04		017		001	1.35-01	- `	-4E+00	8.0E-02		2	2
E-04 2 216 16 160 1.3E-01 E-04 2 216 16 16 150 1.3E-01 E-04 2 216 16 16 150 1.3E-01 E-04 2 216 16 16 16 1.3E-01 E-04 2 216 16 16 150 1.3E-01 E-04 2 216 16 16 150 1.3E-01	IIIOA	1754	20-10-2	20.25.02	10.0		017		001	1.35-01			4.0E-02	1	2	Š
E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01		10/1	1.05-02	7.7E-07	0.05-04		017		160	1.35-01		.4E+00	8.0E-02	5.9E-04	2	2
E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01 E-04 2 216 16 160 1.3E-01	1	8449		2.25.02	3.2E_04		316	4	194			45.00	20.70			
E.04 2 216 16 160 1.3E-01 E.04 2 216 16 160 1.3E-01	Charle #2	13352		2 2E-02	1 35.04		246		091	1	-	00.00	4.05.02	Ì	2	2
E-04 2 216 16 16 15E-01	Wolf Den	6859		2.2F-02	3.25.04		216		091	L		45400	1.05-02	8.0E-03	2 2	2
10-35-U	100	1000		20.00	4 25 04		017		001			2012	4.05-02	١	<u>و</u>	Q.
Acute critical effect is slight to moderate skin tiritation. Critical Study: Palmer 1980 **Chronic critical effects are well defined erythema and edema. Critical Study: Lewis 1989	you	13051	2.05-03	7.25-02	1.35-04		710		160	1.35-01	-	4E+00	1.6E-02		2	2
"Chronic critical effects are well defined erythema and edema. Critical Study: Lewis 1989	Acute critical effect is slik	th to moderal	te skin irritation. Cri	tical Study: Paln	ner 1990											
	"Chronic critical effects a	re well define	d erythema and ede	ma. Critical Stu	dv: Lewis 1989											
															+	T
											1				1	

Indiana bat risk characterization for fog oil exposure under Pasquill Category D.

Mobile Smoke															
						Chronic	Acute 190	Chronic 190	SAIMS						
	Distance		4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	Dally Chronic Intake	•	Toxicity Value	Uncertainty	Uncertainty	Z.	Chronic	Adjusted TRV	Hazard	Hazard	Acute	Chronic
	E	Daily Acute Intake Value (g/m²)	ike Value (g/m²)	Value (g/kg-day)	Value (g/m²)	(g/m²)	Adjustment	Adjustment	(g/m³)	TRV (g/m³)	(g/kg-day)	Quotient	Quotlent	Effect	Effect
Summer Foraging/Roosting Innalation	ting innalation													T	
	0067		70.5	1.5E-06	9	0.1	16	160	3.8E+00	6.3E-04	2.16-07	2.7E-03		2	×
	2006	50-10-0	200	7.6E-07			9	160	3.8E+00	8.3E-04	2.1E-07		3.6E+00	2	, ×
	4500		603	3.0E-07			16	160	3.8E+00		2.1E-07	L		2	>
	0009		-03	1.5E-07			16	160	3.8E+00	ı	2.1E-07		7.75.01	2	S S
	9500		-04	7.6E-08		0.1	9	160	3.8E+00	1	2 1E-07			2 2	2
	16500		-04	3.0E-08		0.1	16	460	3 RF+00		2 45 07	20.00	3.00-01	Q.	2
	26500	1.0E-04	-04	1.5E-08			4	034	2000	1	6.15-07			2	S
							2	281	3.05+00	1	2.1E-07		7.2E-02	운	ž
*Acute critical effect is oil pneumonia. Critical Study: Shinn et al., 1987	I pneumonia.	Critical Study: Shir	nn et al. 1987							1					
"Chronic critical effects are minor lesions of the heart liver and lungs. Critical Study. Dakes	are minor lesk	ons of the heart live	er and lines Cr	1.	1 1000										
			26.00	-1	1992										
	Distance			Dally Chesale Intake	Shauda Taulalle.	Chronic	Acute IKV	Chronic TRV	Acute			Acute	Chronic		
	(E)	Daily Acute Intake Value (g/kg)	ke Value (n/km)	Value (ofter day)	Value (ette)	l oxicity Value	Uncertainty	Uncertainty	TR.			Hazard	Hazard	Acute	Chronic
			(Aug)	Agine (Nunhana)	value (g/kg)	(g/kg)	Adjustment	Adjustment	(g/kg)	Chronk	Chronic TRV (g/kg)	Quotient	Quotient	Effect	Effect
Summer Foragina/Roosting Ingestion	ing Ingestion														Γ
	6500	0 75 0	2	20 17 7											
	8500		3 8	1.10-03			9	1600	1.1E+00	1	4E-02	8.8E-05	7.7E-02	ટ	2
	2000		3 3	9.3E-04		22	19	1600	1.1E+00	-	4E-02	4.4E-05	3.8E-02	2	2
	0000		9 8	2.1E-04		22	9	1600	1.1E+00	+	4E-02	1.8E-05	1.5E-02	2	2
	00077		9 3	1.1E-04	17.6	22	16	1600	1 1E+00		4E-02	8.8E-06	7.7E-03	ž	Ž
	nnces		90	5.3E-05		22	16	1600	1.1E+00	-	1.4E-02	4.4E-06	3 AF 03	2 2	2 2
	+00000	1.95-06	3 :	2.1E-05		22	16	1600	1.1E+00	-	4E-02	1.8E-06	1.55-03	2	2
	**00000		2	1.1E-05	17.6	22	16	1600	1.1E+00	÷	1.4E-02	8.8E-07	7.7E-04	2	2
ere etaethe lecition at the	in and the	of lowform of the live		1											
TO THE STATE OF TH	The County of th	TO TO SOLITE OF CHIEF IN	er, spieen, and i	daney. Critical Study:	Gramachan 1958										
Citionic critical effect is gastrointestinal irration. Critical Study: Lewis 1989	unseluionsen	nal irreation. Critica	I Study: Lewis 15	189						-					Ī
		DAILY ACITE												İ	
	Dietance		Skin Surface			Chronic	Acute TRV	Chronic TRV	Acute			Acute	Chronic	l	T
	(E)		Area (m2)	Dermany absorbed	Acute Toxicity	Toxietty Value	Uncertainty	Uncertainty	₹			Hazard	Hazard	Acute	Chronic
		T	1	nose (SwS-day)	Value (g/kg)	(g/kg)	Adjustment	Adjustment	(g/kg)	Chronk	Chronic TRV (g/kg)	Quotlent	Quotlent	Effect	Effect
Summer Foraging/Roosting Dermal Absorption	ing Dermal Ab	sorption							1						
	0059	1.0E-02	2.2E-02	9.5E-04		246	a t	007	10,10	- -					
	8500	5.0E-03	2.2E-02	4.8E-04		218	2 4	86	10-10-1	- -	Z-14.	8.0E-02	7.1E-04	Š	Š
	14500		2.2E-02	1 9E-04		246	2 9	001	1000		1.4E+00	4.0E-02	3.5E-04	Š	8 N
	22000	1.0E-03	2.2E-02	9.55-05		346	9	202	1.35-01		1.4E+00	1.6E-02	1.4E-04	ž	Š
	35500		2 25.02	4 95.06		017	2	091	1.3E-01	-	4E+00	8.0E-03	7.1E-05	oN.	Š
	50000+		20 20 0	20.10	7	212	9	160	1.35-01	+	1.4E+00	4.0E-03	3.5E-05	ž	2
	50000++		20-27	00-18-1		216	16	160	1.3E-01	-	1.4E+00	1.6E-03	1.4E-05	ž	2
		10.1		8.0E-00		216	16	160	1.3E-01	÷	1.4E+00	8.0E-04	7.1E-06	2	2
*Acitie erities effect is elicht to moderate nige eine regient mige en population of the leaf of the first of the leaf of the	the to modern	o roll living	Total Control	0007						-					
*Chronic critical efforts are well defined enghance and others.	are well define	d southerns and ad	incar Study. Pall	1890											
		De l'incilia alla c	Jeilla. Cilical Oll	dy. Lewis 1909											T
														F	
														,	

Indiana bat risk characterization for fog oil exposure under Pasquill Category E.

						Chronic	Acute TRV	Chronic TRV	Acute		Chronic Dose	Activa	, olasais		
-	Distance (m)	Daily Acute Intake Value (g/m³)	ike Value (g/m³)	Dally Chronic Intake Value (g/kg-day)	*Acute Toxicity Value (a/m³)	Toxicity Value	Uncertainty	Uncertainty	₹ <u>{</u>	Chronic	Adjusted TRV	Hazard	Hazard	Acute	Chronic
								Tiplinen for		1 m/8) Au	(g/kg-day)	Cuotient	Quotient	Effect	Effect
Winter Hibernation Inhalation	lation													1	
Musquave monow				20 10 0											
Carde #2			200	20.5			16		1	- 1	2.1E-07			ટ	2
Wolf Den	8609	1.0E.03	36	1.3C-0.	3	1.0	16	160	3.8E+00	6.3E-04	2.1E-07	5.3E-04	6.1E-01	ટ	ટ્ટ
yor			-03	1.45.07			91		L	-	2.1E-07			Š	S
Bally McCann Hollow				10-10-1			0	160		-	2.15-07	1		Š	Ş
Brooks	5803	2.0E-03	-03	3.35-08		-	4		2 00.00		1000	1			
Davis #2			-02	6.7E-07	9		2 4	094	3 85.00	ł	2.15-07			2	ž
Wolf Den	3861	5.0E-03	-03	2.3E-07			2 4		3.05+00		2.1E-0/			Š	Yes
yor	_	1.0E-02	-02	5.3F-07			9		3.6E+00	6.3E-04	2.1E-07	1.3E-03	1.1E+00	Š	Yes
Mush Paddle Hollow						3	2		3.85+00	ı	2.1E-07	-		ž	× 68
Brooks	10335		9	0.0E+00			19	150	3 6 1.00	1	10 11 0				
Davis #2			-02	5.6E-07			2 4	100	3.00+00		2.1E-07			ĝ	Š
Wolf Den	8432	1.0E-04	-04	2.6E-09	9	5	2 4	190	200	6.3E-04	2.15-07	2.7E-03	2.7E+00	2	\$ 6
Joy	1751	1.0E-02	-02	3.4E-07			2 4	100	3.00+00	1	2.1E-07		1	Š	2
Ballard Hollow							2	001	3.05+00	b.3E-04	2.1E-07	ı		ž	χφ2
Brooks	8449	1.0E-03	.03	1.0E-08	9	6	4	460	2 85100		10 17 0				
Davis #2	13352	5.0E-04	90	0.0E+00	09	0	2 4	200	3.85.700	1	2.1E-0/		4.9E-02	Š	Š
Wolf Den	6859	2.0E-03	63	4.5E-08	9	0.1	9	9	201100	0.30-04	2.10-07	1.35-04	0.0E+00	Š	Ž
yor	13821	5.0E-04	, 04	0.0E+00	09	0.1	8	160	3 85100	1	2. IE-0/		2.15-01	2	Š
								3	200	1	Z. 15-07		0.0	Ş	2
"Acute critical effect is oil pneumonia. Critical Study: Shinn et al. 1987	pneumonia.	Critical Study: Shi	nn et al. 1987							1				1	
"Chronic critical effects are minor lesions of the heart, liver and lungs. Critical Study: Driver el	are minor lesio	ns of the heart, live	er and lungs. Crit	1	af. 1992										
													-		
			H			Chronic	Acute TRV	Chronic TRV	Acute			Actife	Phronic		
	Distance	•	9	Dermally absorbed	*Acute Toxicity	Toxicity Value	Uncertainty	Uncertainty	TRV			Hazam	Harard	80116	1
	Ê	(a/m²)	Area (m²)	dose (g/kg-day)	Value (g/kg)	(g/kg)	Adjustment	Adjustment	(g/kg)	Chronic	Chronic TRV (a/kg)	Quotient	Quotient	F	Fitters
										r					
Winter Hibernation Dermai Absorption	al Absorption													+	
Musgrave Hollow															T
Brooks	8031	5.0E-03	0.0220	6.4E-04	2	216	16	160	1.3E-01	-	1.4E+00	4 OF 02	7 75 04	1	
Davis #2	6624	1.0E-02	0.0220	1.3E-03	2	216	16	160	1.3E-01		4F+00	20 HO 8	20.00	2 2	2
Wolf Den	8609	5.0E-03	0.0220	6.4E-04	2	216	9	160	1.3E-01		E+00	4 OF 02	4 75 04	2 2	2
you	5447	1.0E-02	0.0220	1.3E-03	2	216	16	160	1.3E-01	-	1.4E+00	8 OF-02	9.58-04	2 2	2 2
Bally McCann Hollow	1000	100		-						-				2	
Brooks	2803	1.0E-02	0.0220	9.6E-04	2	216	16	160	1.3E-01		1.4E+00	8.0F-02	7 1F-04	ž	2
7# SIARO	2923	1.05-02	0.0220	9.6E-04	2	216	16	160	1.3E-01	-	1E+00	8.0E-02	7 1E-04	2	2 2
אסוו	3001	1.0E-02	0.0220	9.6E-04	2	216	16	160	1.3E-01	÷	1.4E+00	8.0E-02	7.16-04	2	2
Minch Daddle Hollow	1007	1.05-02	0.0220	9.6E-04	2	216	16	160	1.3E-01	+	1.4E+00	8.0E-02	7.15-04	2	ž
Brooks	10135	205.03	00000	1000	ľ										
C# siveC	2889	1 00 00	0.0220	1.05-04	2	216	9	160	1.35-01	1,4	1.4E+00	1.6E-02	1.2E-04	ટ	2
Wolf Den	8437	5.0E-03	0.020	4.05.04	7	216	16	9	1.35-01	-	1.4E+00	8.0E-02	5.9E-04	ટ્ટ	2
vol	1751	4 05 02	0.020	4.05-04	7	216	9	160	1.35.01	1,4	.4E+00	4.0E-02	3.0E-04	ટ	2
Ballard Hollow		70.70	07700	0.0	7	2.16	16	160	1.3E-01		4E+00	8.0E-02	5.9E-04	ž	ટ
Brooks	8449	5.0E-03	0 0 0 0 0 0 0	125.04	6	990	-	-							
Davis #2	13352	2.0E-03	0.0220	135-04	2	210	9	160	1.35-01	-	1.4E+00	4.0E-02	2.4E-04	Š	2
Wolf Den	6829	5.0E-03	0.0220	3.25-04	4 6	210	2 3	3	1.35-01	-	1.4E+00	1.6E-02	9.5E-05	o N	ž
yor	13821	2.0E-03	0 0 0 0	4 3E-04	7 6	017	٤	160	1.35-01	+	1.4E+00	4.0E-02	2.4E-04	ž	ટ
				10.1	7	017	Q.	160	1.3E-01		1.4E+00	1.6E-02	9.5E-05	ę	Ž
Acute critical effect is slig	tht to moderate	e skin irritation. Cr.	itical Study: Palm	ner 1990						1					
*Chronic critical effects are well defined enythema and edema. Critical Study: Lewis 1989	e well defined	erythema and ede	ma. Critical Stud	y: Lewis 1989					1						
									+	+	+	+	+	+	1
										1				_	_

Indiana bat risk characterization for fog oil exposure under Pasquill Category E.

Mobile Smoke															
				1	A a state of	Chronic	Acute TRV	Chronic TRV	Acute		Chronic Dose	Acute	Chronic		
	(m)	Dally Acute Intake Value (g/m³)	re Vatue (g/m²)	Value (g/kg-day)		(p/m³)	Adjustment	Adjustment	(g/m²)	TRV (g/m³)	Adjusted TRV (g/kg-day)	Quotient	Quotient	Acute	Chronic
Summer Foraging/Roosting Inhalation	ting inhalation									H					
	300		-02	1.65-06		0.1	16	160	3.8E+00		2.1E-07	2.7E-03	7.2E+00	Ŷ	Yes
	4000		93	7.6E-07		0.1	16	160	3.8E+00	6.3E-04	2.15-07	1.3E-03	3.6E+00	ž	Yes
	7000		03	3.0E-07		0.1	16	160	3.8E+00	6.3E-04	2.15-07		1.45+00	ž	Yes
	10000		.03	1.5E-07		0.1	91	160	3.8E+00		2.1E-07		7.2E-01	2	2
	16000		04	7.6E-08	09	0.1	16	160	3.8E+00		2.1E-07		3.6E-01	2	2
	30000		94	3.0E-08		0.1	16	160	3.8E+00	ļ	2.1E-07	5.3E-05	1.4E-01	2	2
	20000	1.0E-04	90	1.55-08		0.1	16	160	3.8E+00		2.1E-07		7.2E-02	2	Š
										l					
*Acute critical effect is oil pneumonia. Critical Study: Shinn et al. 1987	il pneumonia.	Critical Study: Shi	nn et al. 1987												
"Chronic critical effects are minor lesions of the heart, liver and lungs. Critical Study: Driver	are minor lesic	ons of the heart, live	of and lunds. Cr		et al. 1992									-	
						Chronic	Acute TRV	Chronic TRV	Acute			Acute	Chronic	t	I
	Distance			Dally Chronic Intake	*Acute Toxicity	Toxicity Value	Uncertainty	Uncertainty	TRV			Hazard	Hazard	Acute	Chronic
	Œ)	Dally Acute Intake Value (g/kg)	re Value (g/kg)	Value (g/kg-day)	Value (g/kg)	(g/kg)	Adjustment	Adjustment	(g/kg)	Chronic	Chronic TRV (g/kg)	Quotient	Quotient	Effect	Effect
														1	
Summer Foraging/Roosting Ingestion	ting Ingestion													\dagger	
	7500	9.7E-05	05	1.1E-03		22	16	1600	1.1E+00		1.4E-02	8.8E-05	7.7E-02	2	2
	10000		905	5.3E-04		22	16	1600	1.1E+00	•	1.4E-02	4.4E-05	3.8E-02	2	2
	18000		05	2.1E-04		22	16	1600	1.1E+00	-	1.4E-02	1.8E-05	1.5E-02	ž	ž
	30000		90	1.15-04		22	16	1600	1.1E+00	_	1.4E-02	8.8E-06	7.7E-03	2	S
	50000		90	5.3E-05		22	16	1600	1.1E+00		1.4E-02	4.4E-06	3.8E-03	2	2
	50000+		90	2.1E-05		22	16	1600	1.1E+00		1.4E-02	1.85-06	1.5E-03	2	2
	++00009+	9.7E-07	-07	1.1E-05	17.6	22	16	1600	1.1E+00		1.4E-02	8.8E-07	7.7E-04	2	2
*Acute critical effects are weight loss and lesions of the liver, spleen, and kidney. Critical Str	s weight loss a	and lesions of the liv	er, spleen, and	χ̈́	Bramachari 1958										
**Chronic critical effect is gastrointestinal irritation. Critical Study: Lewis 1989	s gastrointestir	nal irritation. Critica	Study: Lewis 1												
		_			,	Chronic	Acute TRV	Chronic TRV	Acute			Acute	Chronic		
	Distance	5	Skin Surface	Dermally absorbed	*Acute Toxicity	Toxicity Value	Uncertainty	Uncertainty	TRV			Hazard	Hazard	Acute	Chronic
	(E)	(a/m²)	Area (m²)	dose (g/kg-day)	Value (g/kg)	(g/kg)	Adjustment	Adjustment	(g/kg)	Chroni	Chronic TRV (g/kg)	Quotient	Quotient	Effect	Effect
Summer Foraging/Roosting Dermai Absorption	ting Dermai At	ł													
	nne/					216	91	160	1.3E-01	•	1.4E+00	8.0E-02		ž	ž
	10000		0.0220			216	16	160	1.3E-01	_	4E+00	4.0E-02		ş	ş
	18000		0.0220		2	216	91	160	1.3E-01	•	1.4E+00	1.6E-02		ž	ž
	30000		0.0220			216	16	160	1.3E-01		4E+00	8.0E-03		2	Š
	20000					216	91	160	1.3E-01		1.4E+00	4.0E-03	l	Ž	2
	50000+		0.0220		2	216	16	160	1.3E-01		1.4E+00	1.6E-03	1.45-05	Š	2
	++0000¢+	1.0E-04	0.0220	9.5E-06		216	16	160	1.3E-01		1.4E+00	8.0E-04	7.1E-06	2	2
*Acute critical effect is slight to moderate skin irritation. Critical Study: Palmer 1990	dight to modera	ate skin Irritation. C	ritical Study: Pa	Imer 1990											
*Chronic critical effects are well defined enythema and edema. Critical Study: Lewis 1989	are well define	d enythema and ed	ema. Critical Stu	idy: Lewis 1989											
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Attachment F: Fog Oil - Mobile Smoke

Indiana bat risk characterization for fog oil exposure under Pasquill Category B.

	_		_	_	_	_									
	Distance (m)	Daily Acute Intake Value	ntake Value	Daily Chronic Intake Value (g/kg- day)	*Acute Toxicity Value (g/m³)	"Chronic Toxicity Value (g/m³)	Acute TRV Uncertainty Adjustment	Chronic TRV Uncertainty Adjustment	Acute TRV (g/m³)	Chronic TRV (g/m³)	Chronic Dose Adjusted TRV (g/kg-day)	Acute Hazard Quotient	Chronic Hazard Quotient	Acute Effect	Chronic
		2							П						
Summer Foraging/Roosting Inhalation	vosting Inhalatio									:					
	4000		-02	2.6E-07	09	0.1	16	160	3.8E+00	6.3E-04	2.1E-07	i	İ	2 :	9
	4000		-03	1.3E-07		0.1	16	160	3.8E+00	6.3E-04	2.1E-07			2 :	Ž :
	2000		-03	5.1E-08		0.1	9	160	3.8E+00	6.3E-04	2.1E-07			2	ž
	2000		-03	2.6E-08		0.1	16	160	3.8E+00	6.3E-04	2.1E-07			2	ž
	0009	5.0E-04	-04	1.3E-08		0.1	16	160	3.8E+00		2.1E-07			õ	Ň
	8000	2.0E-04	ģ.	5.1E-09		0.1	16	160	3.8E+00		2.1E-07	5.3E-05	2.4E-02	2	ž
	12000		-04	2.6E-09		0.1	16	160	3.8E+00	6.3E-04	2.1E-07			S	2
*Acute critical effect is oil pneumonia.	s oil pneumonia	Critical Study:	Shinn et al. 1987												
**Chronic critical effects are minor lesions of the heart, liver and lungs.	cts are minor let	sions of the heart,	liver and lungs.	Critical Study: Driver	et al. 1992										
	i			Daily Chronic	*Acrite Towinite	**Chronic	Acute TRV	Chronic TRV	Acute			Acute	Chronic	Acute	Chronic
	Ulstance (m)	Daily Acute Intake Value (g/kg)	ke Value (g/kg)	mitane value (ging- day)		(g/kg)	Adjustment	Adjustment	(g/kg)	Chronic	Chronic TRV (g/kg)	Quotient	Quotient	Effect	Effect
Openious Economic	roitage faciliar														
ADDO	4000	9.7E-05	-05	2.9E-04	17.60	22	16	1600	1.1E+00	- -	1.4E-02	8.8E-05	2.1E-02	2	ž
	2000		-05	1.5E-04	17.	22	16	1600	1.1E+00	-	1.4E-02	4.4E-05		2	ž
	0009		-05	5.9E-05			16	1600	1.1E+00	1	1.4E-02	1.8E-05		2	2
	7000	9.7E-06	90-	2.9E-05			16	1600	1.1E+00	-	1.4E-02	8.8E-06	2.1E-03	S _O	ž
	9500		90-	1.5E-05			16	1600	1.1E+00	-	1.4E-02	4.4E-06		ટ	ž
	14000		90-	5.9E-06			16	1600	1.1E+00	-	.4E-02	1.8E-06	4.3E-04	2	ž
	20000		-07	2.9E-06	17.60	22	16	1600	1.1E+00	- 1	4E-02	8.8E-07		2	ž:
1000		ond location of the	inor coolean ac	An an analysis of the state and section of the lives explore and kidney Critical St.		358		:	:		1			:	
**Chronic critical effect is gastrointestinal irritation. Critical Study. Lewis 1989	ct is gastrointes	tinal irritation. Criti	ical Study: Lewis	s 1989	5						The state of the s				
									1						
	Dietance	Daily Acute Intake Value	Skin Surface	Dermally absorbed	*Acute Toxicity	**Chronic	Acute TRV	Chronic TRV	Acute			Acute	Chronic	Acute	Chronic
	(m)	(g/m²)	Area (m²)			(g/kg)	Adjustment	Adjustment	(g/kg)	Chronic	Chronic TRV (g/kg)	Quotient	Quotient	Effect	Effect
ı															
Summer Foraging/Roosting Dermai Absorption	oosting Dermai	Absorption 1 0F-02	2.2E-02	2.7E-04				160			1.4E+00	8.0E-02			Ž
	2000		i			216		160	1.3E-01	. -	1.4E+00	4.0E-02	:		
	0009				2		16	160	!	1	1.4E+00	1.6E-02	4.0E-05	2	2
	7000	1.0E-03	2.2E-02	2.7E-05				160	1.3E-01	_	1.4E+00	8.0E-03			Ž
	9500							160			1.4E+00	4.0E-03		2	Ž
	14000					216	16	160			1.4E+00	1.6E-03			Ž
	20000	1.0E-04	2.2E-02	2.7E-06				160	1.3E-01	1	1.4E+00	8.0E-04	2.0E-06		Ž
"Acute critical effect is slight to moderate skin irritation. Critical Study: Palmer 1990	is slight to mode	erate skin irritation.	Critical Study:	Study: Palmer 1990											
*Channia asition official officers are mall defined england	oto oro suco dofir	pur cauchano por	Contract of the party of the pa	Chindry Louis 10HC					_	_					

Indiana bat risk characterization for fog oil exposure under Pasquill Category B.

		Only Acres Intake Value		Daily Chronic	*Acute Toxicity	**Chronic	Acute TRV	Chronic TRV	Acute	Chronic	Chronic Dose	Acute	Chronic	Acute	Chronic
	Distance (m)	(g/m³)		intake value (g/kg- day)	Value (g/m³)	(g/m³)	Adjustment	Adjustment		TRV (g/m³)	(g/kg-day)	Quotient	Quotient	Effect	Effect
Winter Hiberation Inhalation	ation														
Brooks	6037	2.0E-04	4	1.2E-09	09	0.1	16	160	3.8E+00	6.3E-04	2.1E-07	5.3E-05	5.9E-03	Š	S
Davis #2		1.0E-02	2	2.5E-07	9	0.1	16	160	3.8E+00	6.3E-04	2.1E-07	2.7E-03	1.2E+00	2	Yes
Wolf Den		1.0E-02	2	1.7E-07	09	0.1	16	160	3.8E+00	6.3E-04	2.1E-07	2.7E-03	8.0E-01	2	₽
yot		1.0E-02	12	2.0E-07	09	0.1	16	160	3.8E+00	6.3E-04	2.1E-07	2.7E-03	-	2	2
Acute critical effect is oil one monia. Critical Study. Shinn et al. 1987	 oneumonia	Critical Study: Sh	nn et al. 1987							:		1	:		
"Chronic critical effects are minor lesions of the heart, liver and lungs. Critical Study. Driver	s are minor les	ions of the heart, liv	er and lungs. (et al. 1992										
	Dietange	Daily Acute Intake Value	Skin Surface	Skin Surface Dermally absorbed	*Acute Toxicity	**Chronic	Acute TRV Uncertainty	Chronic TRV Uncertainty	Acute			Acute Hazard	Chronic Hazard	Acute	Chronic
	E)		Area (m²)	dose (g/kg-day)		(g/kg)	Adjustment	Adjustment	(g/kg)	Chroni	Chronic TRV (g/kg)	Quotient	Quotient	Effect	Effect
Winter Hibernation Dermal Absorption	mal Absorption	_							- 1						
Brooks	2092	1.0E-03	2.2E-02	3.6E-05	2	216		160			.4E+00	8.0E-03		2	2
Davis #2	3927	1.0E-02	2.2E-02	3.6E-04	2	216	16	160		_	1.4E+00	8.0E-02		2	2
Wolf Den		,	2.2E-02	3.6E-04	2	216	16	160	1.3E-01	1	1.4E+00	8.0E-02	2.7E-04	2	2
yof	3682	1.0E-02	2.2E-02	3.6E-04	2	216	16	160	1.3E-01		.4E+00	8.0E-02	2.7E-04	2	2
*Acute critical effect is slight to moderate skin irritation. Critical Study: Palmer 1990	slight to moder	rate skin irritation.	Critical Study: F	Palmer 1990											
*Chronic critical effects are well defined erythema and edema. Critical Study: Lewis 1989	are well define	ed erythema and et	Jema. Critical §	Study: Lewis 1989											

Indiana bat risk characterization for fog oil exposure under Pasquill Category C.

	Distance	Daily Acute Intake Value	ntake Value	Intake Value (g/kg-	*Acute Toxicity	Toxicity Value	Uncertainty	Uncertainty		Chronic	Adjusted TRV	Hazard	Hazard	Acute	Chronic
	Œ	(a/b)	5	day)	Value (g/m²)	(g/m²)	Adjustment	Adjustment	(g/m²)	TRV (g/m²)	(g/kg-day)	Quotient	Quotient	Effect	Effect
Summer Foraging/Roosting Inhalation	sting Inhalation														
	3500	1.0E-02	92	2.6E-07	09	0.1	16	160	3.8E+00	6.3E-04	2.1E-07	2.7E-03	1.2E+00	2	Yes
	3500	5.0E-03	63	1.3E-07	9	0.1	16	160	3.8E+00	6.3E-04	2.1E-07	1.3E-03	6.1E-01	ટ	2
	4000	2.0E-03	දි	5.1E-08	9	0.1	16	160	3.8E+00	6.3E-04	2.1E-07	5.3E-04	2.4E-01	2	Š
	5500	1.0E-03	93	2.6E-08	9	0.1	16	. 160	3.8E+00	6.3E-04	2.1E-07	2.7E-04		S	Š
	7500		\$	1.3E-08	09	0.1	16	160	3.8E+00	6.3E-04	2.1E-07	1.3E-04	6.1E-02	S	S
	12000	2.0E-04	\$	5.1E-09	9	0.1	16	160	3.8E+00	6.3E-04	2.1E-07	5.3E-05	2.4E-02	2	Š
	18500	1.0E-04	40	2.6E-09	09	0.1	16	160	3.8E+00	6.3E-04	2.1E-07	2.7E-05	1.2E-02	2	Š
*Acute critical effect is oil pneumonia.	oil pneumonia.	Critical Study: Shinn et al. 1987													
ronic critical effect	s are minor les	**Chronic critical effects are minor lesions of the heart, liver and lungs.		Critical Study: Driver et	et al. 1992										
				Daily Chronic		**Chronic	Acute TRV	Chronic TRV	Acute			Acute	Chronic		
	Distance (m)	Daily Acute Intake Value (g/kg)	ce Value (g/kg)	Intake Value (g/kg- day)	Acute Toxicity Value (g/kg)	Toxicity Value (g/kg)	Uncertainty Adjustment	Uncertainty Adjustment	(g/kg)	Chronic	Chronic TRV (g/kg)	Hazard Quotient	Hazard Quotient	Acute Effect	Chronic Effect
Summer Foragina/Roosting Ingestion	sting Ingestion														
	3500	9.7E-05	-05	2.9E-04	17.60	22	16	1600	1.1E+00	1,1	4E-02	8.8E-05		2	ž
	4000	4.9E-05	-05	1.5E-04	17.60	22	16	1600	1.1E+00	-	1.4E-02	4.4E-05		2	ž
	9200	1.9E-05	-05	5.9E-05	17.60	22	16	1600	1.1E+00	1,1	1.4E-02	1.8E-05		2	ž
	8000		99	2.9E-05		22	16	1600	1.1E+00	1,1	1.4E-02	8.8E-06	2.1E-03	S.	Ň
	12000		90	1.5E-05	17.60	22	16	1600	1.1E+00	*;	.4E-02	4.4E-06	1.1E-03	ž	2
	24000		9	5.9E-06	17.60	22	16	1600	1.1E+00	-	4E-02	1.8E-06		2	ž
	40000	9.7E-07	-07	2.9E-06	17.60	22	16	1600	1.15+00		4E-02	8.8E-07	2.1E-04	2	ž
te critical effects a	re weight loss	Acute critical effects are weight loss and lesions of the liver spleen, and kidney.	liver soleen and	d kidney. Critical Study	dv. Bramachari 1958	58									
ronic critical effect	is gastrointest	**Chronic critical effect is gastrointestinal irritation. Critical Study. Lewis 1989	cal Study. Lewis												
		Daily Acute	o tito		1	**Chronic	Acute TRV	Chronic TRV	Acute	3		Acute	Chronic		
	Distance (m)	(g/m²)		dose (g/kg-day)	Acute loxicity Value (g/kg)	l oxicity Value (g/kg)	Uncertainty Adjustment	Uncertainty Adjustment	(g/kg)	Chronic	Chronic TRV (g/kg)	Hazard Quotient	Hazard Quotient	Acute	Chronic
Summer Foraging/Roosting Dermal Absorption	sting Dermal A	Absorption													
	3500	1.0E-02	2.2E-02	2.7E-04		216	16	160	1.3E-01	1.1	4E+00	8.0E-02	2.0E-04	2	Ž
				1.3E-04		216	1	160	1.3E-01	7.	4E+00	4.0E-02		2	Ž
	- 1	2.0E-03		5.3E-05	2	216	16	160	1.3E-01	7	4E+00	1.6E-02	4.0E-05	2	2 ∶
	9000		2.25-02	2.7E-03	7	210		190	1 20 0		46+00	0.00		2 2	Z
	24000		2.2E-02	5.3E-06	2	216	9	160	1.3E-01	-	4E+00	1.6E-03		2	Ž
	40000		2.2E-02	2.7E-06		216		160	1.3E-01	-	4E+00	8.0E-04	2.0E-06	£	ž
ute critical effect is	slight to moder	*Acute critical effect is slight to moderate skin irritation. Critical Study. Palmer 1990	Critical Study:	² almer 1990			a construction of the construction of				The second secon				į
nonic critical effect	s are well defin	ned erythema and	edema. Critical	**Chronic critical effects are well defined erythema and edema. Critical Study: Lewis 1989											

Indiana bat risk characterization for fog oil exposure under Pasquill Category C.

	Distance	Daily Acute Intake Value	itake Value	Daily Chronic Intake Value (a/ko-	*Acute Toxicity Toxicity Value	"Chronic Toxicity Value	Acute TRV	Chronic TRV Uncertainty	Acute	Chronic	Chronic Dose Adjusted TRV	Acute	Chronic	Acute	Chronic
	(E)	(g/m³)	13)	day)	Value (g/m³)	(g/m³)	Adjustment	Adjustment	(g/m³)	TRV (g/m³)	(g/kg-day)	Quotient	Quotient	Effect	Effect
Winter Hiberation Inhalation	lation														
Brooks	s 6037	5.0E-04	90	3.1E-09	09	0.1	16	160	ļ	6.3E-04	2.1E-07	1.3E-04	1.5E-02	2	2
Davis #2		2.0E-03	හි	5.0E-08	9	0.1	16	160	3.8E+00	6.3E-04	2.1E-07	5.3E-04	2.4E-01	ટ	2
Wolf Den	n 3878	2.0E-03	-03	3.4E-08	09	0.1	16	160	3.8E+00	6.3E-04	2.1E-07	5.3E-04	1.6E-01	ž	£
yof	y 3682	2.0E-03	-03	3.9E-08	09	0.1	16	160	3.8E+00	6.3E-04	2.1E-07	5.3E-04	1.9E-01	S	2
*Acute critical effect is oil oneumonia Critical Study: Shinn et al. 1987	oil oneumonia	Critical Study: St	hinn et al. 1987												
**Chronic critical effects are minor lesions of the heart, liver and lungs. Critical Study: Driver	s are minor lesi	ions of the heart, li	iver and lungs.		et al. 1992										
		ı—					Acute TRV	Chronic TRV	Acute			Acute	Chronic		
	Distance (m)	Intake Value (g/m²)	Skin Surface Area (m²)	Skin Surface Dermally absorbed Area (m²) dose (g/kg-day)	*Acute Toxicity Value (g/kg)	Toxicity Value (g/kg)	Uncertainty Adjustment	Uncertainty Adjustment	TRV (g/kg)	Chroni	Chronic TRV (g/kg)	Hazard Quotient	Hazard	Acute Effect	Chronic
Winter Hibernation Dermal Absorption	rmal Absorption														
Brooks	s 6037	1.0E-03	2.2E-02	3.6E-05	2	216	16	160	1.3E-01	-	.4E+00	8.0E-03	2.7E-05	2	Š
Davis #2		5.0E-03	2.2E-02	1.8E-04	2		16	160		_	1.4E+00	4.0E-02		ટ	Š
Wolf Den	n 3878	5.0E-03	2.2E-02	1.8E-04	2	216	16	160	1.3E-01		.4E+00	4.0E-02	Ī	2	9N
yof	y 3682	5.0E-03	2.2E-02	1.8E-04	2	216	16	160	1.3E-01		.4E+00	4.0E-02	1.3E-04	2	2
														-	
*Acute critical effect is slight to moderate skin irritation. Critical Study: Palmer 1990	slight to moder	ate skin irritation.	Critical Study:	Palmer 1990											
**Chronic critical effects are well defined enythema and edema. Critical Study: Lewis 1989	ts are well defin	ed enythema and	edema. Critical	Study: Lewis 1989											

Indiana bat risk characterization for fog oil exposure under Pasquill Category D.

Purple P	Static Sillone	_		_												
1162-03 1162-04 1162		Distance (m)	Daily Acute Is	ntake Value դ³)	Daily Chronic Intake Value (g/kg- day)	*Acute Toxicity Value (g/m³)	"Chronic Toxicity Value (g/m³)	Acute TRV Uncertainty Adjustment	Chronic TRV Uncertainty Adjustment		Chronic TRV (g/m³)	Chronic Dose Adjusted TRV (g/kg-day)	Acute Hazard Quotient	Chronic Hazard Quotient	Acute Effect	Chronic Effect
10E-02 12E-04 12E-05 1																
106-02 126-03 126-04 126-05 1	Summer Foraging/Rc	osting Inhalatio.														
Substitute Sub		3200		-02	2.6E-07	90	0.1	16	160	3.8E+00	6.3E-04	2.1E-07			2	Yes
2.0E.0.3 5.1E.0.9 0.1 16 160 3.EE.00 0.1 16 160 3.EE.00 0.2.EG.07 2.EE.07 5.EE.04 1.EG.07 1.EG.0		4500		-03	1.3E-07	9	0.1		160	3.8E+00	6.3E-04	2.1E-07			2	2
10E-03 12E-04 12E-04 10E 1	A DESCRIPTION OF THE PROPERTY	9200		-03	5.1E-08	9	0.1	9	160	3.8E+00		2.1E-07		2.4E-01	2	S
Circle Stands, Circ		8500		-03	2.6E-08	9	0.1	16	160	3.8E+00		2.1E-07		1.2E-01	S.	S.
Critical Study Chical Chical Study Chical Chical Study Chical Chical		12500		-04	1.3E-08	9	0.1	16	160	3.8E+00		2.1E-07		6.1E-02	2	2
Critical Study Shrine at a 1987 Charlest Study Shrine at a 1987 Charlest Study Shrine at a 1987 Charlest Study Shrine at a 1987 Charlest Study Shrine at a 1987 Charlest Study Shrine at a 1987 Charlest Study Shrine at a 1987 Charlest Study Shrine at a 1987 Charlest Study Shrine at a 1987 Charlest Shrine at a 1980 Charlest Shrine at 1980 Charlest Shrine at a 1980 Charlest Shrine at a 1980 Char		22500		94	5.1E-09	09	0.1	16	160	3.8E+00	6.3E-04	2.1E-07	5.3E-05	2.4E-02	2	2
Chical Study Shim at at 1997 Chical Study Chronic and large. Chical Study Shim at at 1997 Chical Study Shim at at 1997 Chical Study Shim at at 1997 Chical Study Shim at at 1997 Chical Study Chronic and large. Chical Study Chronic and large. Chical Study Chronic and large. Chronic and l		35500		-04	2.6E-09	90	0.1	16	160	3.8E+00	6.3E-04	2.1E-07	2.7E-05	1.2E-02	Š	2
Critical Study, Shinn et al. 1982 Chical Study, Chical Study, Chical Study, Chical Study, Chical Study, Chical Study, Chical Study, Chical Study, Chical Study, Chical Study, Chical Study, Chical Study, Chical Study, Chical Study, Chical Study, Chical Study State Toxicity Value (girg) Chical Study State Toxicity Chical Study State																
Daily Acute Daily Acute Daily Script Study; Divide glassy Chronic FRV Chroni	*Acute critical effect i.	s oil pneumonia.	Critical Study: St	hinn et al. 1987						i						
Daily Acute Intake Value (glkg) Acute Toxicity Value Uncertainty TRV Chronic TRV Chron	**Chronic critical effe	cts are minor les	sions of the heart,	liver and lungs.	Critical Study: Driver	et al. 1992										
Part Part					Daily Chronic		"Chronic	Acute TRV	Chronic TRV	Acute			Acute	Chronic		
STECK STEC		Distance	Deally & state	College College	Intake Value (g/kg-	*Acute Toxicity	Toxicity Value	Uncertainty	Uncertainty	TRV	incord	· TDV (alka)	Hazard	Hazard	Acute	Chronic
15E-05 15E-04 176 22 16 1600 11E+00 14E-02 14E-0		Ê	Dally Acute Inta	ke value (g/kg)	gay)	value (g/kg)	(g/kg)	Adjustment	Adjustment	(g/kg)		C INV (U/NG)	duolielit	Capolletic	בוופנו	בוופנו
15.05 15.0	Summer Foracing/Ro	osting Ingesting														
17.6 22 16 1600 11E+00 14E-02 44E-05 1.1E-02 No 17.6 22 16 1600 1.1E+00 1.4E-02 1.8E-05 4.1E-03 No 17.6 22 16 1600 1.1E+00 1.4E-02 4.8E-06 1.1E-03 No 17.6 22 16 1600 1.1E+00 1.4E-02 4.8E-06 4.3E-03 No 17.6 22 16 1600 1.1E+00 1.4E-02 4.8E-06 4.3E-03 No 17.6 22 16 1600 1.1E+00 1.4E-02 8.8E-07 2.1E-04 No 17.8 22 16 1600 1.1E+00 1.4E-02 8.8E-07 2.1E-04 No Adute Toxicity Toxicity Value Toxicity Value Toxicity Value Toxicity Value Toxicity Value Toxicity Value Toxicity Value Toxicity Value Toxicity Value Toxicity Value Toxicity Value Toxicity Value Toxicity Value Toxicity Value <td>500000000000000000000000000000000000000</td> <td>6500</td> <td></td> <td>-05</td> <td>2.9E-04</td> <td>17.6</td> <td>22</td> <td>16</td> <td>1600</td> <td>1.1E+00</td> <td>-</td> <td>4E-02</td> <td>8.8E-05</td> <td></td> <td>2</td> <td>2</td>	500000000000000000000000000000000000000	6500		-05	2.9E-04	17.6	22	16	1600	1.1E+00	-	4E-02	8.8E-05		2	2
17.6 22 16 1600 1.1E+00 1.4E+02 1.8E+06 4.3E+03 No 17.6 22 16 1600 1.1E+00 1.4E+02 8.8E+06 2.1E+03 No 17.6 22 16 1600 1.1E+00 1.4E+02 1.8E+06 4.3E+04 No 17.6 22 16 1600 1.1E+00 1.4E+02 1.8E+06 4.3E+04 No 17.6 22 16 1600 1.1E+00 1.4E+02 1.8E+06 4.3E+04 No 17.6 22 16 1600 1.1E+00 1.4E+02 1.8E+04 No 3.E-01 1.0 1.1E+00 1.4E+02 8.8E+07 2.1E-03 No Adult 1.0 1.1E+00 1.4E+02 1.8E+04 No 1.8E+04 No Adult 1.0 1.0 1.4E+02 1.8E+06 2.1E+04 No 1.8E+07 2.1E+04 No Adult 1.0 1.0 1.3E+01 </td <td></td> <td>8500</td> <td></td> <td>-05</td> <td>1.5E-04</td> <td>17.6</td> <td>22</td> <td>16</td> <td>1600</td> <td>1.1E+00</td> <td>-</td> <td>4E-02</td> <td>4.4E-05</td> <td></td> <td>2</td> <td>2</td>		8500		-05	1.5E-04	17.6	22	16	1600	1.1E+00	-	4E-02	4.4E-05		2	2
17.6 22 16 1600 1.1E+00 1.4E+02 8.6E+06 2.1E-03 No 1.7E+02 1.4E+02 4.4E+06 1.1E+03 No 1.7E+02 1.4E+02 1.4E+02 4.4E+06 1.1E+03 No 1.7E+02 1.4E+02 1.4E+02 1.4E+03 No 1.7E+03 No		14000		-05	5.9E-05	17.6	22	16	1600	1.1E+00		.4E-02	1.8E-05	4.3E-03	2	2
176 22 16 1600 1 IE+00 1 4E-02 4 4E-06 1 1E-03 No 176 22 16 1600 1 1E+00 1 4E-02 8 8E-07 2 1E-04 No 176 22 16 1600 1 1E+00 1 4E-02 8 8E-07 2 1E-04 No 19. Bramachari 1958 "**Chronic TRV Chronic TRV Acute		22000		90-	2.9E-05		22	16	1600	1.1E+00	-	.4E-02	8.8E-06		S	No
17.6 22 16 1600 1.1E+00 1.4E+02 1.8E+06 4.3E-04 No Y. Bramachari 1968 "Chronic Acute TRV Chronic TRV Acute TRV (g/kg) Chronic TRV (g/kg) Acute Chronic TRV (g/kg) Chronic TRV (g/kg) Acute Chronic TRV (g/kg) Chronic TRV (g/kg) Acute Chronic		35500		99	1.5E-05		22	16	1600	1.1E+00	-	4E-02	4.4E-06		2	Š
176 22 16 1600 1.1E+00 1.4E+02 8.8E+07 2.1E-04 No		20000+		9	5.9E-06	17.6	22	16	1600	1.1E+00	-	.4E-02	1.8E-06		N.	No
Technolic Toxicity		++000005		-07	2.9E-06	17.6	22	16	1600	1.1E+00		.4E-02	8.8E-07		S.	2
Yearute Toxicity Toxicity Value Acute TRV Chronic TRV Acute Acute Chronic TRV (g/kg) Acute Chronic TRV (g/kg) Acute Chronic TRV (g/kg) Acute Chronic TRV (g/kg) Acute Chronic TRV (g/kg) Acute Chronic TRV (g/kg) Acute<																
Chronic Chronic Chronic TRV Chronic	*Acute critical effects	are weight loss	and lesions of the	liver, spleen, ar	id kidney. Critical Stud		20									-
Table Tabl	"Chronic critical effe	ct is gastrointes	tinal irritation. Crit	ical Study: Lewis	1989											:
National Parametric			Daily Acute				**Chronic	Acute TRV	Chronic TRV	Acute			Acute	Chronic		
2.7E-04 2 2.1E-04 Adjustment Adjustment (g/kg) Chronic TRV (g/kg) Quotient Quotient Effect 2.7E-04 2 2.16 16 156 13E-01 1.4E+00 8.0E-02 2.0E-04 No 5.3E-05 2 2.16 16 160 13E-01 1.4E+00 8.0E-02 9.9E-05 No 7.3E-05 2 2.16 16 160 1.3E-01 1.4E+00 8.0E-02 9.9E-05 No 7.3E-05 2 2.16 16 1.60 1.3E-01 1.4E+00 8.0E-02 A.0E-05 No 5.3E-06 2 2.16 1.6 1.60 1.3E-01 1.4E+00 8.0E-03 9.9E-05 No 5.3E-06 2 2.16 1.6 1.6 1.3E-01 1.4E+00 4.0E-03 9.9E-05 No 5.3E-06 2 2.16 1.6 1.6E-03 1.4E+00 8.0E-03 9.9E-05 No 5.7E-06 2 2.16		Distance	Intake Value	Skin Surface	Dermally absorbed	*Acute Toxicity	Toxicity Value	Uncertainty	Uncertainty	TR			Hazard	Hazard	Acute	Chronic
2 TE-04 2 216 16 160 13E-01 1.4E+00 8.0E-02 2.0E-04 13E-04 2 216 16 160 1.3E-01 1.4E+00 4.0E-02 9.9E-05 5.3E-05 2 216 16 160 1.3E-01 1.4E+00 4.0E-02 9.9E-05 5.3E-05 2 216 16 16 1.3E-01 1.4E+00 4.0E-03 2.0E-05 5.3E-05 2 216 16 16 1.3E-01 1.4E+00 4.0E-03 9.9E-06 5.7E-06 2 2.16 16 16 1.3E-01 1.4E+00 4.0E-03 9.9E-06 2 2.16 16 16 1.3E-01 1.4E+00 8.0E-03 4.0E-05 2 2.16 16 16 1.3E-01 1.4E+00 8.0E-04 2.0E-06 5.7E-06 2 2.16 16 1.6 1.3E-01 1.4E+00 8.0E-04 2.0E-06		Ē	(g/m²)	Area (m²)	dose (g/kg-day)	Value (g/kg)	(g/kg)	Adjustment	Adjustment	(g/kg)	Chroni	c TRV (g/kg)	Quotient	Quotient	Effect	Effect
2.7E-04 2 216 16 160 15E-01 1.4E+00 8.0E-02 2.0E-04 1.3E-04 2 216 16 160 1.3E-01 1.4E+00 4.0E-02 9.9E-05 2.7E-05 2 216 16 160 1.3E-01 1.4E+00 4.0E-02 9.9E-05 2.7E-05 2 216 16 160 1.3E-01 1.4E+00 4.0E-03 2.0E-05 5.3E-06 2 216 16 160 1.3E-01 1.4E+00 4.0E-03 9.9E-06 5.7E-06 2 216 16 150 1.3E-01 1.4E+00 4.0E-03 9.9E-06 2.7E-06 2 216 16 150 1.3E-01 1.4E+00 8.0E-04 2.0E-06 2.7E-06 2 2.16 16 150 1.3E-01 1.4E+00 8.0E-04 2.0E-06 8.6E-04 2.0E-06 2 2.0E-06 2.0E-06 2.0E-06 2.0E-06 2.0E-06 2.0E-06 <td>Summer Foraging/Ro</td> <td>vosting Dermal A</td> <td>Absorption</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	Summer Foraging/Ro	vosting Dermal A	Absorption													
13E-04 2 216 16 16 16 15E-01 14E+00 4.0E-02 9.9E-05 5.3E-05 2 2.16 16 160 1.3E-01 1.4E+00 1.6E-02 9.9E-05 1.3E-05 2 2.16 16 160 1.3E-01 1.4E+00 4.0E-03 2.0E-06 5.3E-06 2 2.16 16 160 13E-01 1.4E+00 1.6E-03 9.9E-06 2.7E-06 2 2.16 16 160 1.3E-01 1.4E+00 8.0E-04 2.0E-06 2.7E-06 2 2.16 16 150 1.3E-01 1.4E+00 8.0E-04 2.0E-06 8.8B-04 2.0E-06 2.0E-06 2.0E-06 2.0E-06 2.0E-06 2.0E-06 2.0E-06 2.0E-06		6500	1.0E-02				216	16	160	1.3E-01	-	4E+00	8.0E-02			2
5.3E-05 2 216 16 <t< td=""><td></td><td>8500</td><td></td><td></td><td></td><td></td><td>216</td><td>16</td><td>160</td><td>1.3E-01</td><td>-</td><td>4E+00</td><td>4.0E-02</td><td></td><td></td><td>S</td></t<>		8500					216	16	160	1.3E-01	-	4E+00	4.0E-02			S
2.7E-05 2 216 16 160 13E-01 1.4E+00 8.0E-03 2.0E-05 1.3E-05 2 2.16 16 160 1.3E-01 1.4E+00 4.0E-03 9.9E-06 2.7E-06 2 2.16 16 160 1.3E-01 1.4E+00 1.6E-03 4.0E-06 2.7E-06 2 2.16 16 160 1.3E-01 1.4E+00 8.0E-04 2.0E-06 8 0 0 - 0 1.3E-01 1.3E-01 1.4E+00 8.0E-04 2.0E-06 1 0 0 0 1.3E-01 1.4E+00 8.0E-04 2.0E-06		14000					216	16	160	1.3E-01	-	4E+00	1.6E-02		No	ž
1.3E-05 2 216 16 160 13E-01 1.4E+00 4.0E-03 9.9E-05 5.3E-06 2 2.16 16 160 1.3E-01 1.4E+00 1.6E-03 4.0E-06 2.7E-08 2 2.16 16 1.5E-01 1.4E+00 8.0E-04 2.0E-06 8.0E-04 2.0E-06 2.0E-06 2.0E-06 2.0E-06 2.0E-06 8.0E-04 2.0E-06 2.0E-06 2.0E-06 2.0E-06 2.0E-06		22000					216	16	160	1.3E-01		.4E+00	8.0E-03	2.0E-05	2	2
5.3E-06 2 216 16 156 13E-01 1.4E+00 1.6E-03 4.0E-06 2.7E-06 2 2.16 1.6 1.3E-01 1.4E+00 8.0E-04 2.0E-06 8.0E-04 2.0E-06 2.0E-06 2.0E-06 2.0E-06 2.0E-06		35500					216	16	160	1.3E-01	1	.4E+00	4.0E-03			S
2.7E-06 2 216 16 156-01 1.3E-01 1.4E+00 8.0E-04 2.0E-06 s 1989		\$0000÷					216	16	160	1.3E-01	***	.4E+00	1.6E-03			운
*Acute critical effect is slight to moderate skin irritation. Critical Study: Palmer 1990 **Chronic critical effects are well defined erythema and edema. Critical Study: Lewis 1989	The same management was made of the same o	++00009					216	16	160	1.3E-01		4E+00	8.0E-04			2
*Acute critical effect is slight to moderate skin irritation. Critical Study: Palmer 1990 "Chronic critical effects are well defined erythema and edema. Critical Study: Lewis 1989																
"Chronic critical effects are well defined elythema and edema. Unical Study: Lewis 1909	*Acute critical effect i	s slight to mode	rate skin irritation.	Critical Study: 1	Palmer 1990											
	"Chronic critical ette	cts are well defi.	ned enythema and	edema. Critica	Study. Lewis 1959											

Indiana bat risk characterization for fog oil exposure under Pasquill Category D.

	Distance	Daily Acute Intake Value	-	Daily Chronic Intake Value (g/kg-	*Acute Toxicity	"Chronic Toxicity Value	Acute TRV Uncertainty	Chronic TRV Uncertainty	Acute TRV	Chronic	Chronic Dose Adjusted TRV	Acute Hazard	Chronic Hazard	Acute	Chronic
	(m)	(g/m³)	ر,	day)	Value (g/m³)	(g/m³)	Adjustment	Adjustment	(g/m³)	TRV (g/m³)	(g/kg-day)	Quotient	Quotient	Effect	Effect
														_	
Winter Hiberation Inhalation	ation														
Brooks	6037	1.0E-03	03	6.2E-09	09	0.1	16	160	3.8E+00	6.3E-04	2.1E-07		2.9E-02	No	N _o
Davis #2	3927	5.0E-03	93	1.3E-07	9	0.1	16	160	3.8E+00	6.3E-04	2.1E-07	1.3E-03	6.0E-01	S N	Š
Wolf Den	3878	5.0E-03	03	8.5E-08	09	0.1	16	160	3.8E+00	6.3E-04	2.1E-07	1.3E-03	4.0E-01	No	N _o
Joy	3682	5.0E-03	03	9.8E-08	09	0.1	16	160	3.8E+00	6.3E-04	2.1E-07	1.3E-03	4.7E-01	S S	2
			1007												:
Acute critical effect is oil pheumonia. Critical Study, Shinn et al. 1907	oii prieumonia.	Critical Study, Sh.	ILLI BI BI 190/												
"Chronic critical effects are minor lesions of the heart, liver and lungs. Critical Study: Driver	s are minor lesi	ons of the heart, li	iver and lungs.		et al. 1992										
		1-				**Chronic	Acute TRV	Chronic TRV	Acute			Acute	Chronic		
	Distance	Intake Value	Skin Surface	Skin Surface Dermally absorbed	*Acute Toxicity	Toxicity Value	Uncertainty	Uncertainty	TRV			Hazard	Hazard	Acute	Chronic
	(m)	(g/m²)	Area (m²)	dose (g/kg-day)	Value (g/kg)	(g/kg)	Adjustment	Adjustment	(g/kg)	Chroni	Chronic TRV (g/kg)	Quotient	Quotient	Effect	Effect
Winter Hibernation Dermal Absorption	mal Absorption														
Brooks	2609	1.0E-02	2.2E-02	3.6E-04	2	216	16	160	1.3E-01	-	.4E+00	8.0E-02	2.7E-04	2	å
Davis #2	3927	1.0E-02	2.2E-02	3.6E-04	2	216	16	160	1.3E-01	1.	.4E+00	8.0E-02	2.7E-04	ę	8 N
Wolf Den	3878	1.0E-02	2.2E-02	3.6E-04	2	216	16	160	1.3E-01	1	.4E+00	8.0E-02	2.7E-04	S	_S
yot	3682	1.0E-02	2.2E-02	3.6E-04	2	216	16	160	1.3E-01	•	.4E+00	8.0E-02	2.7E-04	Ñ	No
*Acute critical effect is slight to moderate skin irritation. Critical Study: Palmer 1990	slight to modera	ate skin irritation.	Critical Study: F	almer 1990											
**Chronic critical effects are well defined erythema and edema. Critical Study: Lewis 1989	s are well define	ed erythema and t	edema. Critical	Study: Lewis 1989											

Indiana bat risk characterization for fog oil exposure under Pasquill Category E.

Distance (m)		Daily Acute Intake Value			"Chronic	Acrite TRV								
mmer Foraging/Roosting Inf	-	(a/m³)	Intake Value (g/kg- dav)	*Acute Toxicity Value (a/m³)	Toxicity Value	Uncertainty Adjustment	Uncertainty Adjustment	Acute TRV (a/m³)	Chronic TRV (a/m³)	Chronic Dose Adjusted TRV (q/kq-dav)	Acute Hazard Quotient	Chronic Hazard Quotient	Acute	Chronic Effect
mmer Foraging/Roosting Inf		h	162					Т						
1 3 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	nalation													
1 3 19	4000	1.0E-02	2.6E-07	9	0.1	16	160	3.8E+00		2.1E-07			2	Yes
3 3		5.0E-03	1.3E-07	9	0.1	16	160	3.8E+00		2.1E-07			N _S	2
3	9000	2.0E-03	5.1E-08	09	0.1	16	160	3.85+00		2.1E-07			e N	2
3		1.0E-03	2.6E-08	09	0.1	16	. 160	3.8E+00		2.1E-07			2	2
35		5.0E-04	1.3E-08	09	0.1	16	160	3.8E+00	6.3E-04	2.1E-07		6.1E-02	ટ	2
90		2.0E-04	5.1E-09	9	0.1	16	160	3.8E+00	6.3E-04	2.1E-07		2.4E-02	2	2
		1.0E-04	2.6E-09	09	0.1	16	160	3.8E+00	6.3E-04	2.1E-07	2.7E-05		2	S.
*Acute critical effect is oil pneumonia.	monia. Critical Study	Critical Study: Shinn et al. 1987												
**Chronic critical effects are minor lesions of the heart, liver and lungs. Critical Study: Driver	nor lesions of the hea	art, liver and lungs.	1 – L	et al. 1992										
					i	1						1		
Distance	ınce		Daily Chronic Intake Value (g/kg-	*Acute Toxicity	-Chronic Toxicity Value	Acute IRV Uncertainty	Chronic 1RV Uncertainty	Acute			Acute	Chronic	Acute	Chronic
(m)	_	Daily Acute Intake Value (g/kg)	day)	Vatue (g/kg)	(g/kg)	Adjustment	Adjustment	(g/kg)	Chron	Chronic TRV (g/kg)	Quotient	Quotient	Effect	Effect
Summer Forsoing/Poosting Indesting	ocitoo													
THE LONG BURGASING IN		9 7E-05	2.9E-04	17.6	22	16	1600	1.1E+00		4E-02	8.8E-05	2.1E-02	2	2
		4.9E-05	1.5E-04	17.6	22	16	1600		-	1.4E-02	4.4E-05		2	Ž
		1.9E-05	5.9E-05	17.6	22	16	1600			1.4E-02	1.8E-05		2	S
		9.7E-06	2.9E-05	17.6	22	16	1600		_	1.4E-02	8.8E-06	2.1E-03	S	2
		4.9E-06	1.5E-05	17.6	22	16	1600		1	1.4E-02	4.4E-06		No	No
50		1.9E-06	5.9E-06	17.6	22	16	1600	1.1E+00	•	1.4E-02	1.8E-06		S.	Š
200	50000++	9.7E-07	2.9E-06	17.6	22	16	1600	1.1E+00	-	1.4E-02	8.8E-07	2.1E-04	S	2
			Participation of the Participa	dr. Drawcohori 1058	0.									
** Acute critical effects are Weignt loss and lesions of the liver, spiedri, and kinney. Critical study.	it loss and lesions or	Critical Study: 1 our	v 1080	Jy. Diamacian 19.	9									
Childric children ellech is gastrolinestiffat inhation. Children study. Lewis 1909	Oli Resultati si Rationi.	Cilical Study. Lew	000											
	Daily Acute	1-			**Chronic	Acute TRV	Chronic TRV	Acute			Acute	Chronic		
Distance	<u>=</u>	S	7	*Acute Toxicity	Toxicity Value	Uncertainty	Uncertainty	TR	i		Hazard	Hazard	Acute	Chronic
(m)	(m/g) (u	Area (m²)	dose (g/kg-day)	Value (g/kg)	(g/kg)	Adjustment	Adjustment	(g/kg)	Chron	Chronic I KV (g/kg)	Quotient	Quotient	ЕПест	ЕПест
Summer Foraging/Roosting Dermal Absorption	rmal Absorption													
	7500 1.0E-02	-02 0.0220	2.7E-04		216		160			1.4E+00	8.0E-02		S	S
	10000 5.0E-03	-03 0.0220	1.3E-04	2	216	16	160		-	1.4E+00	4.0E-02		ž	Š
	18000 2.0E-03		5.3E-05		216		160	_	-	1.4E+00	1.6E-02			2
	30000 1.0E-03	-03 0.0220	2.7E-05		216		160	_	_	1.4E+00	8.0E-03	2.0E-05		2
			1.3E-05		216		160	1.3E-01	-	.4E+00	4.0E-03			N _o
is a	50000+ 2.0E-04				216		160	_		.4E+00	1.6E-03		2	2
200	50000++ 1.0E-	-04 0.0220			216		160	1.3E-01		.4E+00	8.0E-04	2.0E-06		2
*Acute critical effect is slight to moderate skin irritation. Critical Study: Palmer 1990	moderate skin irritati	ion. Critical Study:	Palmer 1990											
Chronic critical effects are well defined erythema and edema. Critical Study: Lewis 1959	il defined erythema a	and edema. Critical	Study: Lewis 1989											

Indiana bat risk characterization for fog oil exposure under Pasquill Category E.

	Distance	Daily Acute Intake Value	take Value	Daily Chronic Intake Value (g/kg-	*Acute Toxicity Toxicity Value	**Chronic Toxicity Value	Acute TRV Uncertainty	Chronic TRV Uncertainty	Acute TRV	Chronic TRV (o/m³)	Chronic Dose Adjusted TRV	Acute Hazard	Chronic Hazard	Acute	Chronic
				,,,,	()				T		(
Winter Hiberation Inhalation	ation														
Brooks	6037	2.0E-03	33	1.2E-08	09	0.1	16	160	3.8E+00	6.3E-04	2.1E-07	5.3E-04	5.9E-02	S	2
Davis #2	3927	1.0E-02	72	2.5E-07	9	0.1	16	160	3.8E+00	6.3E-04	2.1E-07	2.7E-03	1.2E+00	S	Yes
Wolf Den	3878	1.0E-02	22	1.7E-07	9	0.1	16	160	3.8E+00	6.3E-04	2.1E-07	2.7E-03	8.0E-01	S	2
yof	3682	1.0E-02	22	2.0E-07	06	0.1	16	160	3.8E+00	6.3E-04	2.1E-07	2.7E-03	9.3E-01	S	S
*Acute critical effect is oil pneumonia. Critical Study: Shinn et al. 1987	nil pneumonia.	Critical Study: Shi	inn et al. 1987												
**Chronic critical effects are minor lesions of the heart, liver and lungs. Critical Study: Driver	; are minor lesi	ons of the heart, liv	er and lungs.		et al. 1992										
	Dietano	Daily Acute	Skin Surface	Skin Surface Dormativ absorbed	*Acute Toxicity	**Chronic	Acute TRV	Chronic TRV	Acute			Acute	Chronic	Actific	cincado
	(m)		Area (m²)		Value (g/kg)		Adjustment	Adjustment	(g/kg)	Chroni	Chronic TRV (g/kg)	Quotient	Quotient	Effect	Effect
		-													
Winter Hibernation Dermal Absorption	mal Absorption														
Brooks		1.0E-02	0.0220	3.6E-04	2	216	16	160	1.3E-01	-	.4E+00	8.0E-02	2.7E-04	2	2
Davis #2		1.0E-02	0.0220	3.6E-04	2	216	16	160	1.3E-01	+	.4E+00	8.0E-02	2.7E-04	운	운
Wolf Den	3878	1.0E-02	0.0220	3.6E-04	2	216	16	160	1.3E-01	-	1.4E+00	8.0E-02	2.7E-04	2	2
yof	3682	1.0E-02	0.0220	3.6E-04	2	216	16	160	1.3E-01	-	.4E+00	8.0E-02	2.7E-04	2	2
*Acute critical effect is slight to moderate skin irritation. Critical Study: Palmer 1990	slight to modera	ate skin irritation. C	Critical Study: 1	Palmer 1990											
*Chronic critical effects are well defined enythema and edema. Critical Study: Lewis 1989	are well define	d erythema and ed	Jema. Critical	Study: Lewis 1989											

Attachment F: Terephthalic Acid (TPA) Grenades

Indiana bat risk characterization for TPA exposure under Pasquill Category B.

TPA Smoke Grenades														
					Chronic	Acute TRV	Chronic TRV	Acute		Chronic Dose	Acute	Chronic	\dagger	
	Distance	Daily Acute Intake Value (n/m³)	Daily Chronic Intake "Acute]	"Acute Toxicity	Toxicity Value	Uncertainty	Uncertainty	TRV	Chronic	Adjusted TRV	Hazard	Hazard	Acute	Chronic
			(fin Aug)	- A		Unjustinellik	Aujustineint	(m/g)	ו שומו איו	(g/kg-day)	Quotient	Quotient	Effect	Effect
Summer Foraging/Roosting Inhalation	ing Inhalation										1		+	
	3000	9.0E+00	2.9E-03	8.6	8.6	-	30	8 6F+00	2 9F-01	9 7F-05	1 05+00	3 0E±04	78	>
	4000	5.0E-03	1.6E-06			-	30	8.6E+00	2.9E-01	9.7F-05	5 8F-04	1 6F-02	2	8 2
	4000	2.0E-03	6.3E-07			-	30	8.6E+00	2.9E-01	9.7E-05	2.3F-04	6 6F-03	2 2	2 2
	4000	1.0E-03	3.2E-07	8.6	8.6	-	30	8.6E+00	2.9E-01	9.7E-05	1 2F-04	3 3F-03	2 2	2 2
	2000	5.0E-04	1.6E-07	8.6		+	30	8.6E+00		9.7E-05	5.8E-05	1.6E-03	2	2
	2000	2.0E-04	6.3E-08	8.6			30	8.6E+00		9.7E-05	2.3E-05	6.6E-04	S S	2 2
	0009	1.0E-04	3.2E-08			1	30	8.6E+00	2.9E-01	9.7E-05	1.2E-05	3.35-04	2	2
*Acute critical effects are	necrosis and in	 Acute critical effects are necrosis and inflamation of the nasal cavity. Critical Study: Muse et al. 1995 	al Study; Muse et al. 19	362										
**Chronic critical effects	are edema of IL	"Chronic critical effects are edema of lungs and emphysema. Critical Study: Muse et al. 1995	V: Muse et al. 1995										+	
					Chronic	Acute TRV	Chronic TRV	Acute		Chronic Dose	Acute	Chronic		
	Distance		Daily Chronic Intake *Acute		Toxicity Value	Uncertainty	Uncertainty	TRV	Chronic	Adjusted TRV	Hazard	Hazard	Acute	Chronic
	E	Daily Acute Intake Value (g/m²)	Value (g/kg-day)	Value (g/m²)	(a/m,)	Adjustment	Adjustment	(g/m³)	TRV (g/m³)	(g/kg-day)	Quotient	Quotient	Effect	Effect
Winter Hiberation Inhalation	ion													
	3000	9.0E+00	3.8E-03	8.6	8.6	1	30	8.6E+00	2.9E-01	9.7E-05	1 0F+00	4 OF+01	Yes	\ Yes
	4000	5.0E-03	2.1E-06	8.6	8.6	1	30	8.6E+00	2.9E-01	9.7E-05			S	2
	4000	2.0E-03	8.5E-07	9.8	8.6	-	30	8.6E+00	2.9E-01	9.7E-05	2.3E-04	8.8E-03	2	2
	4000	1.0E-03	4.3E-07	8.6	9.6	1	30	8.6E+00	2.9E-01	9.7E-05	1.2E-04		S	S
	9009	5.0E-04	2,1E-07	9.8		-	30	8.6E+00	2.9E-01	9.7E-05	5.8E-05		2	Ž
	2000	2.0E-04	8.5E-08	9'8	9.8	-	30	8.6E+00	2.9E-01	9.7E-05	2.3E-05		2	S
	0009	1.0E-04	4.3E-08	9.8		1	30	8.6E+00	2.9E-01	9.7E-05			2	2
Acute critical effects are	necrosis and i	"Acute critical effects are necrosis and inflamation of the nasal cavity. Critical Study: Muse et al. 1995	al Study: Muse et al. 19	395										
*Chronic critical effects :	are edema of lu	**Chronic critical effects are edema of lungs and emphysema. Critical Study. Muse et al. 1995	ly: Muse et al. 1995											
													-	

Attachment F: TPA Smoke Pots

Indiana bat risk characterization for TPA exposure under Pasquill Category B.

TPA Smoke Pots														
					TAP Bronde									
	Distance		Daily Chronic Intake Acute	*Acute Toxicity	Toxicity Value	Month IRV	Chronic TRV	Acute		Chronic Dose	Acute	Chronic		
	(m)	Daily Acute Intake Value (g/m³)		Value (g/m³)	(m/b)	Adjustment	Adiustment	V (a/m ³)	TDV (c/m³)	Adjusted TRV	Hazard	Hazard	Acute	Chronic
								,		(WAG-DAY)	duotient.	Quotient	Effect	Effect
Summer Foraging/Roosting Inhalation	ting Inhalation													
	3000	9.0E+00	8.6E-04	8.6	8.8	-	02	00,00	100	100				
	4000		4.8E-07	80	8.6		200	00-1100	2.95-01	9.7E-05	1.0E+00	8.9E+00	Yes	Yes
	2000		1.9E-07	cc	86	-	3 8	0.00-100	2.30-01	9.7E-U3	5.8E-04	5.0E-03	S.	2
	2000	1.0E-03	9.6E-08	ac.	98	-	000	0.00100	2.30-01	9.7E-05	2.3E-04	2.0E-03	2	2
	2000		A AF-DA	9.0	90		00	8.65+00	-	9.7E-05	İ	9.9E-04	8 2	2€
	0009		80-30		0.0		30	8.6E+00		9.7E-05	5.8E-05	5.0E-04	å	ટ
	7000		0 66 00		0.0		30	8.6E+00	- [9.7E-05	2.3E-05	2.0E-04	Š	2
			50-10-6		0.0		30	8.6E+00	2.9E-01	9.7E-05	1.2E-05	9.9E-05	Š	2
*Acute critical effects are	necrosis and i	Acute critical effects are necrosis and inflamation of the nasal cavity. Critical Study: Muse et al. 1995	cal Study: Muse et al 19	95										
**Chronic critical effects	are edema of It	"Chronic critical effects are edema of lungs and emphysema. Critical Study. Muse et al. 1995	dy: Muse et al. 1995											
				-	W.P. Brown									
	Distance		Daily Chronic Intake "Acute	*Acute Toxicity	Toxicity Value	Uncertainty	Chronic TRV Uncertainty	Acute	Chronic	Chronic Dose	Acute	Chronic		
	Œ	Daily Acute Intake Value (g/m³)	Value (g/kg-day)	Value (g/m³)	(g/m³)	Adjustment	Adjustment	(g/m³)	TRV (g/m³)	(a/kg-dav)	Quotient	Mazard	Acute	Chronic
												The state of the s	ביופרו	CILECT
Winter I liberation inhalation	tion													
	3000		1.2E-03	8.6	8.6	-	8	A RE+OO	2 OE 04	0 75 06	00.10	10		
	4000		6.4E-07	9.8	A A		300	00.100	1	9.7 5-03	1.0E+00	1.25+01	Yes	Yes
	2000	2.0E-03	2.6E-07	8.6	8.6	-	000	0.00	2.90-01	9.7E-05		6.7E-03	S N	ž
	2000		1.3E-07	8.6	8.6		200	0.00,100	1	9.7E-03		2./E-03	Š	2
	2000	5.0E-04	6 4F-08	AA	C C		3 8	0.01.100		3.7E-U3	1.2E-04	1.3E-03	õ	ž
	0009	2 0F-04	2 GE-08	200	0.0	- -	8	8.65+00	1	9.7E-05	5.8E-05	6.7E-04	8 N	ટ
	7000	1 05-04	1 35 00	0.0	0.0		8	8.6E+00	2.9E-01	9.7E-05	2.3E-05	2.7E-04	°Z	2
			00-30-1	0.0	9.6		30	8.6E+00	2.9E-01	9.7E-05	1.2E-05	1.3E-04	ટ	2
*Acute critical effects are	necrosis and it	Acute critical effects are necrosis and inflamation of the nasal cavity. Critical Study: Muse et al. 1995	al Study: Muse et al 199	95										
**Chronic critical effects	are edema of lu	**Chronic critical effects are edema of lunds and emphysema Critical Study: Mise et al. 1005	ty. Miss of al 1005											
			J. Misso et al. 1000										-	

Attachment F: Titanium Dioxide Grenades

Indiana bat risk characterization for titanium dioxide exposure under Pasquill Category E.

	Distance	Daily Acute Intake Value Daily Chronic Intake *Acute Toxicity	Daily Chronic Intake	*Acute Toxicity	**Chronic Toxicity Value	Acute TRV Uncertainty	Chronic TRV Uncertainty	Acute TRV	Chronic Toy (2)	Chronic Dose Adjusted TRV	Acute Hazard	Chronic Hazard	Acute	Chronic
		/6)	(Aug.au)	· arco (gill)	(1116)	Weinenfac	Wigneria	$\neg \vdash$	(aug)	(B/vB-nay)	danone	Crossen	EIIECI	THOUS THE
Summer Foraging Inhalation	ation													
	100	1.0E-02	4.8E-08	0.25	0.25	-	160	2.5E-01	1.6E-03	5.3E-07	4.0E-02	9.2E-02	2	S
	300	5.0E-03	2.4E-08	0.25	0.25	~	160	2.5E-01	1.6E-03	5.3E-07	2.0E-02	4.6E-02	2	SN.
	900	2.0E-03	9.7E-09	0.25	0.25	-	160	2.5E-01	1.6E-03	5.3E-07	8.0E-03	1.8E-02	ટ	2
	700	1.0E-03	4.8E-09	0.25	0.25	-	160	2.5E-01	1.6E-03	5.3E-07	4.0E-03	9.2E-03	2	Š
	1000		2.4E-09	0.25	0.25	-	160	2.5E-01	1.6E-03	5.3E-07	2.0E-03	4.6E-03	ž	S
	1400		9.7E-10	0.25	0.25	-	160	2.5E-01	1.6E-03	5.3E-07	8.0E-04	1.8E-03	2	2
	1800	1.0E-04	4.8E-10	0.25	0.25	-	160	2.5E-01	1.6E-03	5.3E-07	4.0E-04	9.2E-04	No	S
*Acute toxicity value ass	umed equal to	Acute toxicity value assumed equal to unadjusted chronic LOAE. Acute critical effects are respirate	Acute critical effects a	re respiratory imital	or initiation Critical Study: 1 ewis 1992	· Lewis 1992								
"Chronic critical effects	are respiratory	**Chronic critical effects are respiratory imitation. Critical Study: Lewis 1992	ewis 1992											Ī
					.Chronic			Acute						
	8	Daily Acute Intake Value Daily Chronic Intake 'Acute Toxicity	Daily Chronic Intake	*Acute Toxicity	Toxicity Value	Acute IRV Uncertainty	Chronic IRV Uncertainty		Chronic	Chronic Dose Adjusted TRV	Acute Hazard	Chronic	Acute	Chronic
	(E)	(m/g)	Value (g/kg-day)	Value (g/m²)	(m/6)	Adjustment	Adjustment	(g/m²)	TRV (g/m²)	(g/kg-day)	Quotient	Quotient	Effect	Effect
whiter Hiberation Innalation	uone	20 10 1	C L		100	,								
	200		0.51-00	0.20	0.20		201	7.3E-01	1.0E-U3	5.3E-U/	4.0E-02	1.2E-01	2	2
	300		3.3E-08	0.25	0.25	-	160	2.5E-01	1.6E-03	5.3E-07	2.0E-02	6.2E-02	2	2
	000		1.3E-08	0.25	0.25	-	160	2.5E-01	1.6E-03	5.3E-07	8.0E-03	2.5E-02	No	No
	700		6.5E-09	0.25	0.25	-	160	2.5E-01	1.6E-03	5.3E-07	4.0E-03	1.2E-02	o N	No
	1000		3.3E-09	0.25	0.25	1	160	2.5E-01	1.6E-03	5.3E-07	2.0E-03	6.2E-03	2	S S
	1400		1.3E-09	0.25	0.25	-	160	2.5E-01	1.6E-03	5.3E-07	8.0E-04	2.5E-03	£	8 N
	1800	1.0E-04	6.5E-10	0.25	0.25	1	160	2.5E-01	1.6E-03	5.3E-07	4.0E-04	1.2E-03	ટ	2
*Acute toxicity value as:	sumed equal to	Acute toxicity value assumed equal to unadjusted chronic LOAEL. Acute critical effects are respiral	Acute critical effects a	are respiratory irrita	lory imitation. Critical Study: Lewis 1992	: Lewis 1992								
**Chronic critical effects	are respiratory	**Chronic critical effects are respiratory imitation. Critical Study: Lewis 1992	ewis 1992											
					Ţ	1						7		

Attachment G Risk Characterization - Gray Bat

RISK PARAMETERS FOR GRAY BATS

Summer Foraging Inhalation

Parameter	Abbreviation	Definition
Distance		Number of meters from chemical source to exposure point.
Daily Acute Intake Value		Amount of stressor taken in by the receptor per day.
Daily Chronic Intake Value	·	Amount of stressor taken in by the receptor, averaged over it lifetime, per day.
Acute Toxicity Value		Single chemical exposure.
Chronic Toxicity Value		Chemical exposure averaged over the receptor's lifetime.
Acute Toxicity Reference Value Uncertainty Adjustment	Acute TRV Uncertainty Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological difference between test species and species of concern (receptors).
Chronic Toxicity Reference Value Uncertainty Adjustment	Chronic TRV Uncertainty Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological differences between test species and species of concern (receptors averaged over the receptor's lifetime.
Acute Toxicity Reference Value	Acute TRV	Adjusted (with uncertainty factors) toxicological reference value used as measurement endpoints. A TRV was developed feach receptor.
Chronic Toxicity Reference Value	Chronic TRV	Adjusted (with uncertainty factors) toxicological reference value used as measurement endpoints, averaged over the receptor lifetime. A TRV was developed for each receptor.
Chronic Dose Adjusted Toxicity Reference Value	Chronic Dose Adjusted TRV	A toxicological value adjusted by multiplicative uncertainty factor for chronic (averaged over the receptor's lifespan) exposure.
Acute Hazard Quotient		Equal to expected exposure concentration _{acute} divided TRV _{acute} .
Chronic Hazard Quotient		Equal to daily intake chronic divided by TRV chronic.
Acute Effect		Acute Effect = yes, if Acute Hazard Quotient>1. Acute Effect no, if Acute Hazard Quotient <1.
Chronic Effect		Chronic Effect = yes, if Chronic Hazard Quotient>1. Chronic Effect = no, if Chronic Hazard Quotient<1.

Summer Foraging Ingestion

Parameter	Abbreviation	Definition
Distance		Number of meters from chemical source to exposure point.
Daily Acute Intake Value		Amount of stressor taken in by the receptor per day.
Daily Chronic Intake Value		Amount of stressor taken in by the receptor, averaged over its lifetime, per day.
Acute Toxicity Value		Single chemical exposure.
Chronic Toxicity Value		Chemical exposure averaged over the receptor's lifetime.
Acute Toxicity Reference Value Uncertainty Adjustment	Acute TRV Uncertainty Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological difference between test species and species of concern (receptors).
Chronic Toxicity Reference Value Uncertainty Adjustment	Chronic TRV Uncertainty Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological difference between test species and species of concern (receptors averaged over the receptor's lifetime.
Acute Toxicity Reference Value	Acute TRV	Adjusted (with uncertainty factors) toxicological reference value used as measurement endpoints. A TRV was developed for each receptor.
Chronic Toxicity Reference Value	Chronic TRV	Adjusted (with uncertainty factors) toxicological reference value used as measurement endpoints, averaged over the receptor lifetime. A TRV was developed for each receptor.
Acute Hazard Quotient		Equal to expected exposure concentration _{acute} divided b
Chronic Hazard Quotient		Equal to daily intake chronic divided by TRV chronic.
Acute Effect		Acute Effect = yes, if Acute Hazard Quotient>1. Acute Effect no, if Acute Hazard Quotient <1.
Chronic Effect		Chronic Effect = yes, if Chronic Hazard Quotient>1. Chron Effect = no, if Chronic Hazard Quotient<1.



RISK PARAMETERS FOR GRAY BATS

Summer Foraging Dermal Absorption

Parameter	Abbreviation	Definition
Distance		Number of meters from chemical source to exposure point.
Daily Acute Intake Value		Amount of stressor taken in by the receptor per day.
Skin Surface Area		Surface area of receptor.
Dermally Absorbed Dose		Amount of chemical stressor dermally absorbed by receptor.
Acute Toxicity Value		Single chemical exposure.
Chronic Toxicity Value		Chemical exposure averaged over the receptor's lifetime.
Acute Toxicity Reference Value Uncertainty Adjustment	Acute TRV Uncertainty Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological differences between test species and species of concern (receptors).
Chronic Toxicity Reference Value _ Uncertainty Adjustment	Chronic TRV Uncertainty Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological differences between test species and species of concern (receptors), averaged over the receptor's lifetime.
Acute Toxicity Reference Value	Acute TRV	Adjusted (with uncertainty factors) toxicological reference values used as measurement endpoints. A TRV was developed for each receptor.
Chronic Toxicity Reference Value	Chronic TRV	Adjusted (with uncertainty factors) toxicological reference values used as measurement endpoints, averaged over the receptors lifetime. A TRV was developed for each receptor.
Acute Hazard Quotient		Equal to expected exposure concentration acute divided by TRV acute.
Chronic Hazard Quotient		Equal to daily intake _{chronic} divided by TRV _{chronic} .
Acute Effect		Acute Effect = yes, if Acute Hazard Quotient>1. Acute Effect = no, if Acute Hazard Quotient <1.
Chronic Effect		Chronic Effect = yes, if Chronic Hazard Quotient>1. Chronic Effect = no, if Chronic Hazard Quotient<1.

Maternity Cave Inhalation

Parameter	Abbreviation	Definition
Distance		Number of meters from chemical source to exposure point.
Daily Acute Intake Value		Amount of stressor taken in by the receptor per day.
Daily Chronic Intake Value		Amount of stressor taken in by the receptor, averaged over its lifetime, per day.
Acute Toxicity Value		Single chemical exposure.
Chronic Toxicity Value		Chemical exposure averaged over the receptor's lifetime.
Acute Toxicity Reference Value Uncertainty Adjustment	Acute TRV Uncertainty Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological differences between test species and species of concern (receptors).
Chronic Toxicity Reference Value Uncertainty Adjustment	Chronic TRV Uncertainty Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological differences between test species and species of concern (receptors), averaged over the receptor's lifetime.
Acute Toxicity Reference Value	Acute TRV	Adjusted (with uncertainty factors) toxicological reference values used as measurement endpoints. A TRV was developed for each receptor.
Chronic Toxicity Reference Value	Chronic TRV	Adjusted (with uncertainty factors) toxicological reference values used as measurement endpoints, averaged over the receptors lifetime. A TRV was developed for each receptor.
Chronic Dose Adjusted Toxicity Reference Value	Chronic Dose Adjusted TRV	A toxicological value adjusted by multiplicative uncertainty factors for chronic (averaged over the receptor's lifespan) exposure.
Acute Hazard Quotient		Equal to expected exposure concentration acute divided by TRV acute.
Chronic Hazard Quotient		Equal to daily intakechronic divided by TRVchronic.
Acute Effect		Acute Effect = yes, if Acute Hazard Quotient>1. Acute Effect = no, if Acute Hazard Quotient <1.
Chronic Effect		Chronic Effect = yes, if Chronic Hazard Quotient>1. Chronic Effect = no, if Chronic Hazard Quotient<1.



RISK PARAMETERS FOR GRAY BATS

Maternity Cave Dermal Absorption

Parameter	Abbreviation	Definition
Distance		Number of meters from chemical source to exposure point.
Daily Acute Intake Value		Amount of stressor taken in by the receptor per day.
Skin Surface Area		Surface area of receptor.
Dermally Absorbed Dose		Amount of chemical stressor dermally absorbed by receptor.
Acute Toxicity Value		Single chemical exposure.
Chronic Toxicity Value		Chemical exposure averaged over the receptor's lifetime.
Acute Toxicity Reference Value Uncertainty Adjustment	Acute TRV Uncertainty Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological differences between test species and species of concern (receptors).
Chronic Toxicity Reference Value Uncertainty Adjustment	Chronic TRV Uncertainty Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological differences between test species and species of concern (receptors), averaged over the receptor's lifetime.
Acute Toxicity Reference Value	Acute TRV	Adjusted (with uncertainty factors) toxicological reference values used as measurement endpoints. A TRV was developed for each receptor.
Chronic Toxicity Reference Value	Chronic TRV	Adjusted (with uncertainty factors) toxicological reference values used as measurement endpoints, averaged over the receptors lifetime. A TRV was developed for each receptor.
Acute Hazard Quotient		Equal to expected exposure concentration acute divided by TRVacute.
Chronic Hazard Quotient		Equal to daily intakechronic divided by TRVchronic.
Acute Effect		Acute Effect = yes, if Acute Hazard Quotient>1. Acute Effect = no, if Acute Hazard Quotient <1.
Chronic Effect		Chronic Effect = yes, if Chronic Hazard Quotient>1. Chronic Effect = no, if Chronic Hazard Quotient<1.

Attachment H Risk Characterization - Bald Eagle

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RISK PARAMETERS FOR BALD EAGLES

Winter Inhalation

Parameter	Abbreviation	Definition
Distance		Number of meters from chemical source to exposure point.
Daily Acute Intake Value		Amount of stressor taken in by the receptor per day.
Daily Chronic Intake Value		Amount of stressor taken in by the receptor, averaged over its lifetime, per day.
Acute Toxicity Value		Single chemical exposure.
Chronic Toxicity Value		Chemical exposure averaged over the receptor's lifetime.
Acute Toxicity Reference Value Uncertainty Adjustment	Acute TRV Uncertainty Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological differences between test species and species of concern (receptors).
Chronic Toxicity Reference Value Uncertainty Adjustment	Chronic TRV Uncertainty Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological differences between test species and species of concern (receptors), averaged over the receptor's lifetime.
Acute Toxicity Reference Value	Acute TRV	Adjusted (with uncertainty factors) toxicological reference values used as measurement endpoints. A TRV was developed for each receptor.
Chronic Toxicity Reference Value	Chronic TRV	Adjusted (with uncertainty factors) toxicological reference values used as measurement endpoints, averaged over the receptors lifetime. A TRV was developed for each receptor.
Chronic Dose Adjusted Toxicity Reference Value	Chronic Dose Adjusted TRV	A toxicological value adjusted by multiplicative uncertainty factors for chronic (averaged over the receptor's lifespan) exposure.
Acute Hazard Quotient		Equal to expected exposure concentration $_{\text{acute}}$ divided by $TRV_{\text{acute}}.$
Chronic Hazard Quotient		Equal to daily intake chronic divided by TRV chronic.
Acute Effect		Acute Effect = yes, if Acute Hazard Quotient>1. Acute Effect = no, if Acute Hazard Quotient <1.
Chronic Effect		Chronic Effect = yes, if Chronic Hazard Quotient>1. Chronic Effect = no, if Chronic Hazard Quotient<1.

Winter Ingestion

Parameter	Abbreviation	Definition
Distance		Number of meters from chemical source to exposure point.
Daily Acute Intake Value		Amount of stressor taken in by the receptor per day.
Daily Chronic Intake Value		Amount of stressor taken in by the receptor, averaged over its lifetime, per day.
Acute Toxicity Value		Single chemical exposure.
Chronic Toxicity Value		Chemical exposure averaged over the receptor's lifetime.
Acute Toxicity Reference Value Uncertainty Adjustment	Acute TRV Uncertainty Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological differences between test species and species of concern (receptors).
Chronic Toxicity Reference Value Uncertainty Adjustment	Chronic TRV Uncertainty Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological differences between test species and species of concern (receptors) averaged over the receptor's lifetime.
Acute Toxicity Reference Value	Acute TRV	Adjusted (with uncertainty factors) toxicological reference value used as measurement endpoints. A TRV was developed for each receptor.
Chronic Toxicity Reference Value	Chronic TRV	Adjusted (with uncertainty factors) toxicological reference value used as measurement endpoints, averaged over the receptor lifetime. A TRV was developed for each receptor.
Acute Hazard Quotient		Equal to expected exposure concentration _{acute} divided b TRV _{acute} .
Chronic Hazard Quotient		Equal to daily intake _{chronic} divided by TRV _{chronic} .
Acute Effect		Acute Effect = yes, if Acute Hazard Quotient>1. Acute Effect no, if Acute Hazard Quotient <1.
Chronic Effect		Chronic Effect = yes, if Chronic Hazard Quotient>1. Chron Effect = no, if Chronic Hazard Quotient<1.

RISK PARAMETERS FOR BALD EAGLES

Winter Dermal Absorption

Parameter	Abbreviation	Definition
Distance		Number of meters from chemical source to exposure point.
Daily Acute Intake Value		Amount of stressor taken in by the receptor per day.
Skin Surface Area		Surface area of receptor.
Dermally Absorbed Dose		Amount of chemical stressor dermally absorbed by receptor.
Acute Toxicity Value		Single chemical exposure.
Chronic Toxicity Value		Chemical exposure averaged over the receptor's lifetime.
Acute Toxicity Reference Value Uncertainty Adjustment	Acute TRV Uncertainty Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological differences between test species and species of concern (receptors).
Chronic Toxicity Reference Value Uncertainty Adjustment	Chronic TRV Uncertainty Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological differences between test species and species of concern (receptors), averaged over the receptor's lifetime.
Acute Toxicity Reference Value \	Acute TRV	Adjusted (with uncertainty factors) toxicological reference values used as measurement endpoints. A TRV was developed for each receptor.
Chronic Toxicity Reference Value	Chronic TRV	Adjusted (with uncertainty factors) toxicological reference values used as measurement endpoints, averaged over the receptors lifetime. A TRV was developed for each receptor.
Acute Hazard Quotient		Equal to expected exposure concentration _{acute} divided by TRV _{acute} .
Chronic Hazard Quotient		Equal to daily intake _{chronic} divided by TRV _{chronic} .
Acute Effect		Acute Effect = yes, if Acute Hazard Quotient>1. Acute Effect = no, if Acute Hazard Quotient <1.
Chronic Effect		Chronic Effect = yes, if Chronic Hazard Quotient>1. Chronic Effect = no, if Chronic Hazard Quotient<1.

Summer Inhalation



Parameter	Abbreviation	Definition
Distance		Number of meters from chemical source to exposure point.
Daily Acute Intake Value		Amount of stressor taken in by the receptor per day.
Daily Chronic Intake Value		Amount of stressor taken in by the receptor, averaged over its lifetime, per day.
Acute Toxicity Value		Single chemical exposure.
Chronic Toxicity Value		Chemical exposure averaged over the receptor's lifetime.
Acute Toxicity Reference Value Uncertainty Adjustment	Acute TRV Uncertainty Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological differences between test species and species of concern (receptors).
Chronic Toxicity Reference Value Uncertainty Adjustment	Chronic TRV Uncertainty Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological differences between test species and species of concern (receptors), averaged over the receptor's lifetime.
Acute Toxicity Reference Value	Acute TRV	Adjusted (with uncertainty factors) toxicological reference values used as measurement endpoints. A TRV was developed for each receptor.
Chronic Toxicity Reference Value	Chronic TRV	Adjusted (with uncertainty factors) toxicological reference values used as measurement endpoints, averaged over the receptors lifetime. A TRV was developed for each receptor.
Chronic Dose Adjusted Toxicity Reference Value	Chronic Dose Adjusted TRV	A toxicological value adjusted by multiplicative uncertainty factors for chronic (averaged over the receptor's lifespan) exposure.
Acute Hazard Quotient		Equal to expected exposure concentration acute divided by TRVacute.
Chronic Hazard Quotient		Equal to daily intake chronic divided by TRV chronic.
Acute Effect		Acute Effect = yes, if Acute Hazard Quotient>1. Acute Effect = no, if Acute Hazard Quotient <1.
Chronic Effect		Chronic Effect = yes, if Chronic Hazard Quotient>1. Chronic Effect = no, if Chronic Hazard Quotient<1.

RISK PARAMETERS FOR BALD EAGLES

Summer Dermal Absorption

Parameter	Abbreviation	Definition
Distance		Number of meters from chemical source to exposure point.
Daily Acute Intake Value		Amount of stressor taken in by the receptor per day.
Skin Surface Area		Surface area of receptor.
Dermaily Absorbed Dose		Amount of chemical stressor dermally absorbed by receptor.
Acute Toxicity Value		Single chemical exposure.
Chronic Toxicity Value		Chemical exposure averaged over the receptor's lifetime.
Acute Toxicity Reference Value Uncertainty Adjustment	Acute TRV Uncertainty Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological differences between test species and species of concern (receptors).
Chronic Toxicity Reference Value Uncertainty Adjustment	Chronic TRV Uncertainty Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological differences between test species and species of concern (receptors), averaged over the receptor's lifetime.
Acute Toxicity Reference Value	Acute TRV	Adjusted (with uncertainty factors) toxicological reference values used as measurement endpoints. A TRV was developed for each receptor.
Chronic Toxicity Reference Value	Chronic TRV	Adjusted (with uncertainty factors) toxicological reference values used as measurement endpoints, averaged over the receptors lifetime. A TRV was developed for each receptor.
Acute Hazard Quotient		Equal to expected exposure concentrationscute divided by TRVscute.
Chronic Hazard Quotient		Equal to daily intake divided by TRV chronic.
Acute Effect		Acute Effect = yes, if Acute Hazard Quotient>1. Acute Effect = no, if Acute Hazard Quotient <1.
Chronic Effect	-	Chronic Effect = yes, if Chronic Hazard Quotient>1. Chronic Effect = no, if Chronic Hazard Quotient<1.

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Attachment G: Fog Oil - Static Smoke

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Gray bat risk characterization for fog oil exposure under Pasquill Category B.

				Daily Chronic	_	"Chronic	Acres TOV	701 0100140	Acute		Chronic Doce	Acute	Chronic		
	Distance	Daily Acute Intake Value		Intake Value (g/kg-	*Acute Toxicity	Toxicity Value	Uncertainty	Uncertainty		Chronic	Adjusted TRV	Hazard	Hazard	Acute	Chronic
	Œ	(¿m/6)		day)	Value (g/m²)	(a/m,)	Adjustment	Adjustment	(_w/6)	IRV (g/m.)	(g/kg-day)	Quotient	duonent	בוופכו	FILECT
Summer Foracing Inhalation	alation		-	:					-	1					
	4000	0.0100	Q	2.3E-07	09	0.1	16	160	3.75	6.3E-04	2.1E-07			2	Yes
	4000		9	1.1E-07	9	0.1	16	160	3.75	6.3E-04	2.1E-07	1.3E-03	5.4E-01	2	2
	2000	0.0020	0	4.5E-08	9	0.1	16	160	3.75	6.3E-04	2.1E-07	╝	2.1E-01	2	2
	5000	0.0010	0	2.3E-08		0.1	16	160	3.75	6.3E-04	2.1E-07		1.1E-01	2	S.
	9009	0 0000	2	1.1E-08		0.1	16	160	3.75	6.3E-04	2.1E-07		5.4E-02	ş	ę
	8000	0.0002	21	4.5E-09		0.1	16	160	3.75	6.3E-04	2.1E-07		2.1E-02	S.	2
	12000	0.0001	=	2.3E-09	09	0.1	16	160	3.75	6.3E-04	2.1E-07	2.7E-05	1.1E-02	2	2
*Acute critical effect is oil pneumonia. Critical Study: Shinn et al. 1987	oil pneumonia.	Critical Study: St			- 1				-						
*Chronic critical effects are minor lesions of the heart, liver, and lungs.	ts are minor les	ions of the heart, li		Critical Study: Driver	r et al. 1992					+					
				Daily Chronic		**Chronic	Acute TRV	Chronic TRV	Acute			Acute	Chronic	4.54	1
	Distance (m)	Daily Acute Intake Value (g/kg)	e Value (g/kg)	Intake Value (g/kg- day)	*Acute Toxicity Value (g/kg)	Toxicity Value (g/kg)	Uncertainty Adjustment	Uncertainty Adjustment	TRV (g/kg)	Chronic	Chronic TRV (g/kg)	Hazard	Hazard	Effect	Effect
Summer Foraging Ingestion	estion														
0	4000	0.0100	2	2.6E-04			16	1600	1.10		.4E-02	9.1E-03		2	2
	2000		50	1.36-04			16	1600	5.5	-	1.4E-02	4.5E-03		2	S :
	9009	0.0020	2	5.2E-05			16	1600	-19	-	.4E-02	1.8E-03	İ	2	2
	7000	0.0010	10	2.6E-05			16	1600	.		4E-02	9.1E-04		2	2
	9500		35	1.3E-05	17.6	22	16	1600	9	-	.4E-02	4.5E-04	9.55-04	2 2	2:3
	14000		25	5.2E-06			9	0091	2 .		45-02	1000	1	2 2	2 2
	8500		01	2.6E-06			16	One	2:		45-02	3.5	i		· 2:
Acute critical effects are weight loss and teston of the liver, spleen, and kidney. **Chronic critical effect is nastrointestinal irritation. Critical Sludy, Lewis 1989	are weight loss	and tesion of the li	ver, spleen, and	kidney. Critical Stud s 1989	ly: Bramachari 1958	8			1 :						:
		Daily Acute				**Chronic	Acute TRV	Chronic TRV	Acute			Acute	Chronic	9000	وزمويين
	Distance (m)	Intake Value (q/m²)	Skin Surface Area (m²)	Dermally absorbed dose (g/kg-day)	*Acute Toxicity Value (g/kg)	Toxicity Value (g/kg)	Uncertainty Adjustment	Uncertainty Adjustment	(g/kg)	Chronic	Chronic TRV (g/kg)	Quotient	Quotient	Effect	Effect
Summer Foraging Dermal Absorption	rmal Absorption							150	0.13		4E+00	8 OF 02	2 1E-04	N	No.
	4000							200	2 6	- -	1 45400	4 OF 02		2	S
	2000							160	2 6	-	1 45+00	1 6F-02		2	2
	9000	0.0020	0.026	2.0E-U3	2	216	16	160	0.13		1.4E+00	8.0E-03	2.1E-05	2	Š
	200							160	0.13	-	1.4E+00	4.0E-03	L	2	2
	14000							160	0.13	-	1.4E+00	1.6E-03		S.	ę.
	8500							160	0.13	-	1.4E+00	8.0E-04	2.1E-06	8	2
								ALL LAS PLUS CONTRACTOR CONTRACTO							-
Acute critical effect is slight to moderate skin irritation. Critical Study. Palmer 1990	s slight to mode	erate skin irritation.	Critical Study:	Palmer 1990									-		
			0	200											

Gray bat risk characterization for fog oil exposure under Pasquill Category B.

	Distance (m)	Daily Acute Intake Value (g/m³)		Daily Chronic Intake Value (g/kg- day)	*Acute Toxicity Toxicity Value	**Chronic Toxicity Value	Acute TRV Uncertainty Adjustment	Chronic TRV Uncertainty	Acute TRV	Chronic Text (ala.)	Chronic Dose Adjusted TRV	Acute Hazard	Chronic Hazard	Acute	Chronic
								Walnester.		LIVA (B)(III)	(g/kg-day)	Cuonent	Quotient	E	Effect
Maternity Cave Inhalation	Lo														
Saltpeter #3	3682	0.01	_	1.1E-06	909	1	4	094	27.6	10.00	20 11 0	Ì			
Freeman		80	-	00100			2 9	201	0.70	D.3E-04	Z.1E-U/	-			es,
				200		5	9	160	3.75	6.3E-04	2.1E-07	0.0E+00	0.0E+00 No		No
*Acute critical effect is oil pneumonia. Critical Study: Shinn et al. 1987	oil pneumonia.	Critical Study: St	Jinn et al. 1987												
**Chronic critical effects are minor lesions of the heart, liver, and lungs. Critical Study. Driver	s are minor les	sions of the heart, li	iver, and lungs.	Critical Study. Driver	et al. 1992					+			-	i	
										+				-	
		Daily Acute												_	
	Distance		Skin Surface	Skin Surface Dermally absorbed	**Chronic ***Acute Toxicity Value	"Chronic Toxicity Value	Acute TRV	Chronic TRV	Acute			Acute	Chronic		
	(<u>u</u>)	(g/m²)	Area (m²)		Value (g/kg)	(g/kg)		Adjustment	(a/ka)	Chronic	Chronic TRV (other)	Cristian	Hazard	Acute	Chronic
							Т		(C., E.		(Rust av.	dadient	Caorient	1380	EHECI
Maternity Cave Dermal Absorption	Absorption			The state of the s											
Saltpeter #3		0.0100	0.0260	2.8E-04	2	216	9	180	0 13		76.00	00 10 0			
Freeman	12547	0.0002	0.0260	5.6F-06	6	216		200	2 0	- -	2011	0.UE-UZ	Z.1E-U4 NO		2
					1	27		3	C.13		.4E+00	1.6E-03	4.1E-06		Š
*Acute critical effect is slight to moderate skin irritation. Critical Study: Palmer 1990	slight to moder	rate skin irritation.	Critical Study F	Valmer 1990											
**Chronic critical effects are well defined erythema and edema. Critical Study. Lewis 1989	s are well defir	enythema and e	ema, Critical	Study: Lewis 1989											
									_				-		

Gray bat risk characterization for fog oil exposure under Pasquill Category C.

Charle Charle Toxicity To	Acute TRV Uncertainty Adjustment 16 16 16 16 16				Se Acute	Curonic		
Sign Correct						Hazard Quotient	Acute Effect	Chronic Effect
Secondary Control Co		┞						
3500 0.00100 2.8E-QT 60 0.1 16 160 37.5 6.8E-QH 2.7E-QT 3500 0.0020 4.8E-QB 6.0 0.1 16 160 37.5 6.8E-QH 2.7E-QT 5500 0.0020 4.8E-QB 6.0 0.1 16 160 37.5 6.8E-QH 2.7E-QT 7500 0.0020 4.8E-QB 6.0 0.1 16 160 37.5 6.8E-QH 2.7E-QT 7500 0.0020 4.8E-QB 6.0 0.1 16 160 37.5 6.8E-QH 2.7E-QT 7500 0.0000 4.000 0.0 1.1 16 160 37.5 6.8E-QH 2.7E-QT 7500 0.0000 0.0000 0.0 1.1 16 160 37.5 6.8E-QH 2.7E-QT 7500 0.0000 0.0 1.0 1.6 160 37.5 6.8E-QH 2.7E-QT 7500 1.000 0.0 1.0 1.6								
1.1E-07 66		160				1 16+00		res
Activated Study Chical Study C		\$	ļ			5.4E-01		2
2.3E-08 60		160	-		E-07 5.3E-04	2.1E-01	2	2
11E-08 60		160	-			1.1E-01	2	2
Critical Study: Driver et al. 1992 Chronic Maries Value (g/kg) Chronic TRV (g/kg) Chr		160				5.4E-02	S.	2
Critical Study: Driver et al. 1932 Chronic Telescope Chronic		160				2.1E-02	ş	2
Critical Study: Driver et al. 1992 Chronic TRV Chron		160		3E-04	E-07 2.7E-05	1.1E-02	S.	2
Table Carrolle C								
Stance Activities Activit						· Voltage design		
Sample Daily Acute Intake Value (g/kg) T	Acute TRV		Acute		Acute	Chronic	Acute	Chronic
3500 0.00100 2.6E-04 17.6 2.2 16 1600 1.10 1.4E-0.2 1.200 0.0050 0.00			(g/kg)	Chronic TRV (g/kg)	Quotient	Quotient	Effect	Effect
3500 0 0100 2 EE-04 17 6 22 16 1600 110 1 AE-02 4000 0 0000 1 3E-04 17 6 22 16 1600 110 1 AE-02 8500 0 0000 1 3E-05 17 6 22 16 1600 110 1 AE-02 12000 0 0000 1 3E-05 17 6 22 16 1600 110 1 AE-02 24000 0 0000 1 3E-05 17 6 22 16 1600 110 1 AE-02 24000 0 0000 2 3E-05 17 6 22 16 1600 110 1 AE-02 24000 0 0000 1 0 0000 1 1 0 1 AE-02 1 AE-02 1 AE-02 24000 0 0000 0 0000 1 0 0000 1 0 0000 1 0 0000 1 AE-02 1 0 0 0000 0 0000 1 0 0000 1 0 0000 1 0 0000 1 0 0000 1 0 0000 1 0 0000 1 0 0 0000 0 0000 0 0000 0 0000								
2 SEC-04 17.6 22 16 1600 1.10 14E-02 5 SE-05 17.6 22 16 1600 1.10 14E-02 5 SE-05 17.6 22 16 1600 1.10 14E-02 5 SE-05 17.6 22 16 1600 1.10 14E-02 2 SE-05 17.6 22 16 1600 1.10 14E-02 2 SE-06 17.6 22 16 160 1.10 14E-02 2 SE-06 17.6 22 16 160 1.10 14E-02 9, Critical Study. Bramacheri 1958 160 1.10 14E-02 14E-02 9, Critical Study. Bramacheri 1958 160 1.10 14E-02 9, Critical Study. Bramacheri 1958 160 1.10 14E-02 1 Ke-04 1.10 1.10 1.4E-02 1 Ke-04 1.10 1.4E-02 1.4E-02 1 Ke-04 1.10 1.10 1.4E-02 1 Ke-04 1			1		200	70.00	-	-
1.3E-04 17.6 22 16 1600 1.10 1.4E-02 2.5E-05 17.6 22 16 1600 1.10 1.4E-02 2.5E-05 17.6 22 16 1600 1.10 1.4E-02 2.5E-05 17.6 22 16 1600 1.10 1.4E-02 2.5E-05 17.6 22 16 1600 1.10 1.4E-02 2.5E-05 17.6 22 16 1600 1.10 1.4E-02 2.5E-05 17.6 22 16 1600 1.10 1.4E-02 2.5E-05 17.6 22 16 160 0.13 1.4E-02 2.5E-05 17.6 22 2.16 160 0.13 1.4E-00 2.5E-05 2	1	1600	0.0	1.45-02	30.11.03	1.95-02	2:4	2 2
2.6E-06 17.6 22 16 1600 1.10 14E-02 5.2E-06 17.6 22 16 1600 1.10 14E-02 5.2E-06 17.6 22 16 1600 1.10 14E-02 5.2E-06 17.6 22 16 1600 1.10 14E-02 9, Critical Study, Bramachari 1958 17.6 22 16 1600 1.10 14E-02 9, Critical Study, Bramachari 1958 17.6 22 16 1600 1.10 14E-02 1y, Critical Study, Bramachari 1958 17.6 1.0 1.4E-02 1.4E-02 1stronic 1958 17.6 1.0 1.4E-02 1.4E-02 1stronic 1958 18.6 1.0 1.4E-02 1stronic 1958 1.0 1.0 1.4E-02 1stronic 1958 1.0 1.0 1.4E-02 1stronic 1958 1.0 1.0 1.4E-02 1stronic 1958 1.0 1.0 1.4E-00 1stronic 1958		160	2 5	1.4E-02	1 8E-03	3.8E-03	2 2	2 2
1		200		1 46 00	0 15.04	1 05.03	2	2
1.3E-05 17.6 22 16 1600 1.10 1.4E-02 2.5E-06 17.6 22 16 1600 1.10 1.4E-02 2.5E-06 17.6 22 16 1600 1.10 1.4E-02 3.5E-04 Acute Toxicity Value (g/kg) Adjustment Adjustment (g/kg)		0001	2	4 45 00	3.15.04	0 55 04	2 2	2 2
5.2E-06 17.6 22 16 1500 1.10 1.4E-02 9, Critical Study. Bramachari 1958 22 16 1600 1.10 1.4E-02 9, Critical Study. Bramachari 1958 **Chronic Acute Toxicity Value Uncertainty Uncertainty Uncertainty Uncertainty TRV 1 (g/kg) Value (g/kg) Adjustment Adjustment (g/kg) Chronic TRV (g/kg) 2 8E-04 2 216 16 160 0.13 1.4E-00 5 6E-05 2 266-05 16 160 0.13 1.4E-00 1 4E-04 2 216 16 160 0.13 1.4E+00 2 8E-05 2 216 16 160 0.13 1.4E+00 5 6E-05 2 216 16 160 0.13 1.4E+00 2 8E-05 2 216 16 160 0.13 1.4E+00 2 8E-05 2 216 16 160 0.13 1.4E+00 <		000	2	1.45.02	4 0 0 0	2000	212	2
2 SECOR 17 G 22 16 1600 1 100 1 4E-02 y, Critical Study. Bramachari 1958 "Chronic Maly absorbed Acute Toxicity Value (g/kg) "Chronic TRV (g/kg) Acute Toxicity Value (g/kg) Acute Toxicity Value (g/kg) Acute TRV (g/kg) Acute TRV (g/kg) Chronic TRV (g/kg) Acute TRV (g/kg) Chronic TRV (g/kg) Acute TRV (g/kg) Chronic TRV (g/kg) Acute TRV (g/kg)		1600	2.1	1.45-02	100.0	200		2 2
y, Critical Study. Bramacheri 1958 Acute Toxicity Acute TRV Chronic TRV Acute TRV Acute TRV Chronic TRV Acute TRV (g/kg) Acute TRV (g/kg) Chronic TRV (g/kg) Acute TRV (g/kg) Chronic TRV (g/kg) Acute TRV (g/kg) Chronic TRV (g/kg) Acute TRV (g/kg)		1600	1.2	1.4E-02	9.16-00	1.95-04	2	2:
Second S	1		-		 			
Section Sect			-					
Daily Acute Dermally absorbed Acute Toxicity Toxicity Value Uncertainty Chronic TRV Chronic TRV Chronic TRV Gl/g) Chronic TRV (gl/g) C								
October Skin Surface Dermally absorbed Acute Toxicity Toxicity Value Uncertainty Uncertainty Uncertainty Uncertainty Uncertainty TRV Gl/kg) Chronic TRV (gl/kg) Chronic TR	-	Chronic TRV	Acute		Acute	Chronic		
(g/m³) Area (m³) doše (g/kg-day) Value (g/kg) (g/kg) Adjustment (g/kg) Chronic TRV (g/kg) 0.0100 0.026 2.8E-04 2 2.16 16 160 0.13 1.4E+00 0.0050 0.026 1.4E-04 2 2.16 16 160 0.13 1.4E+00 0.0070 0.026 2.8E-05 2 2.16 16 160 0.13 1.4E+00 0.0010 0.026 2.8E-05 2 2.16 16 160 0.13 1.4E+00 0.0005 0.026 2.8E-05 2 2.16 16 160 0.13 1.4E+00 0.0005 0.026 2.8E-05 2 2.16 16 160 0.13 1.4E+00 0.0007 0.026 2.8E-05 2 2.16 16 160 0.13 1.4E+00 0.0001 0.026 2.8E-05 2 2.16 16 160 0.13 1.4E+00		Uncertainty	TR			Hazard	Acute	Chronic
0.0100 0.026 2.8E-04 2 216 16 16 160 0.13 1.4E+00 0.0050 0.026 0.026 0.026 2.8E-05 2 216 16 160 0.13 1.4E+00 0.0010 0.026 2.8E-05 2 216 16 160 0.13 1.4E+00 0.0005 0.026 2.8E-05 2 216 16 160 0.13 1.4E+00 0.0007 0.026 5.6E-06 2 216 16 160 0.13 1.4E+00 0.0001 0.026 2.8E-06 2 2 216 16 160 0.13 1.4E+00	Adjustment	Adjustment	(g/kg)	Chronic TRV (g/kg)	Quotient	Quotient	ЕПест	Ellect
0.0100 0.026 2.8E-04 2 216 16 160 0.13 1.4E+00 0.0050 0.026 1.4E-04 2 216 16 16 0.03 1.4E+00 0.0020 0.026 5.6E-05 2 216 16 160 0.13 1.4E+00 0.0005 0.026 1.4E-05 2 216 16 160 0.13 1.4E+00 0.0002 0.026 5.6E-06 2 216 16 160 0.13 1.4E+00 0.0001 0.026 2.8E-06 2 2.16 16 160 0.13 1.4E+00 0.0001 0.026 2.8E-06 2 2.26 0.03 0.03 0.03 0.03 0.03 0.04								
1.4E ₂₄ 2 2:6 1:6 1:6 0.13 1.4E+00 5.6E ₂₀₅ 2 2:6 1:6 1:0 0.13 1.4E+00 2.8E ₂₀₅ 2 2:6 1:6 1:0 0.13 1.4E+00 5.6E ₂₀₆ 2 2:6 1:6 1:0 0.13 1.4E+00 2.8E ₂₀₆ 2 2:6 1:6 1:0 0.13 1.4E+00		160	0.13	1.4E+00	8.0E-02	2.1E-04	ફ :	2
6,6E-05 2 2/16 16 160 0.13 1.4E+00 2,8E-05 2 2/16 1/6 1/6 0.13 1.4E+00 1,4E-05 2 2/16 1/6 1/6 0.13 1.4E+00 2,8E-06 2 2/16 1/6 1/6 0.13 1.4E+00 2,8E-06 2 2/16 1/6 1/6 0.13 1.4E+00	•	160	0.	1.45.+00	4.0E-02	1.0E-04	<u>2</u> :	2:
2.8E-05 2 216 16 160 0.13 1.4E+00 1.4E-05 2 216 16 160 0.13 1.4E+00 5.6E-06 2 216 16 160 0.13 1.4E+00 2.8E-06 2 216 16 160 0.13 1.4E+00	•	9	0.13	1.4E+00	1.6E-0.	2 4.1E-05	2	2 2
1,4E.05 2 216 16 160 0.13 1,4E+00 5,6E.06 2 216 16 160 0.13 1,4E+00 2,8E.06 2 216 16 160 0.13 1,4E+00		160	0.13	1.4E+00	8.0E-03		2	2
5.6E-06 2 216 16 160 0.13 1.4E+00 2.8E-06 2 216 16 160 0.13 1.4E+00	3	<u>8</u>	0.13	1.4E+00	4.0E-03	İ		2
2.8E-06 2 216 16 160 0.13 1.4E+00		160	0.13	1.4E+00	1.6E-03			2
		160	0.13	1.4E+00	ω.	;		<u>e</u>
						-		
cute critical effect slight to moderate skin irritation. Critical Study: Palmer 1990						1		
Chronic critical effects are well defined erythema and edema. Critical Study: Lewis 1989								
*Acute critical effect slight to moderate skin irritation. Critical Study: Palmer 1990 **Chronic critical effects are well defined erythema and edema. Critical Study: Lewis 1999	216	9		160	160 0.13	160 0.13 1.4E+00	160 0.13 1.4E+00 8.0E-04	160 0.13 1.4E+00 8.0E-04 2.1E-05

Gray bat risk characterization for fog oil exposure under Pasquill Category C.

	Distance (m)	Daily Acute Intake Value (g/m³)	ntake Value	Daily Chronic Intake Value (g/kg-day)	**Chronic **Chro	**Chronic Toxicity Value	Acute TRV Uncertainty Adjustment	Chronic TRV Uncertainty	Acute TRV	Chronic TBV (2003)	Chronic Dose Adjusted TRV	Acute Hazard	Chronic	Acute	Chronic
							The state of the s	Uninenii Uni	- 1	(B) AN	(g/kg-day)	Quotient	Quotient	Effect	Effect
Maternity Cave Inhalation	ro							+							
Saltpeter #3	3682	00.0	0	2.2F-07	69	40	9					-	i		
Freeman	12547	8	-	001300	3 8		0	201	3.75	6.3E-04	2.1E-07	5.3E-04			Yes
				0.77.00	8	Li	16	160	3.75	6.3E-04	2.1E-07	2.7E-04	0.0E+00 No		ટ્ટ
*Acute critical effect is oil pneumonia. Critical Study: Shinn et al. 1987	oil pneumonia.	Critical Study: St	hinn et al. 1987												
"Chronic critical effects are minn lesions of the heart liver and times Control St. 4.	s are minor les	ing of the bear	and trace		0000										
			and and langs.		et al. 1992									-	!
									-	-		-	-		
		Daily Acute				1	A			-				-	
	Distance	Intake Value	Skin Surface	Skin Surface Dermally absorbed	*Acute Toxicity	٩_	Hocertainty	Uncertainty	Acute Toy			Acute		-	
	Ê	(g/m²)	Area (m²)	dose (g/kg-day)	Value (g/kg)		Adjustment	Adjustment	(a/ka)	Chronic	Chronic TRV (alka)	Hazard	Hazard	Acute	Chronic
									6		(Ruig)	decimant	Cucuent	בוופני	EHOCI
Maternity Cave Dermal Absorption	Absorption														
Saltpeter #3			0.0260	1.4E-04	2	216	4	100	0 43		70.00				
Freeman	12547	0.0002	0.0260	SAFJA	6	0,0		30	2	-	.4E+00	4.0E-02	1.0E-04 No		٥
				20.5	7	017	2	160	0.13	+	4E+00	1.6E-03	4.1E-06 No		Š
*Acute critical effect slight to moderate skin irritation Critical Study Palmer 1000	th to moderate	e skin irritation Cr	ritical Study Pal	mer 1000					-						
*Chronic critical effects	are well defin	o boc company po	John Carlon	2000											
Service of the servic				Siduy. Lewis 1969										!	
									:	-	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				:

Gray bat risk characterization for fog oil exposure under Pasquill Category D.

District District										A						
1960 1960		Distance	Daily Acute In		Daily Chronic Intake Value (g/kg-	*Acute Toxicity	Toxicity Value	Acute TRV Uncertainty	Chronic TRV Uncertainty		Chronic	Chronic Dose Adjusted TRV	Acute	Chronic	Acute	Chronic
Second Common Commo		(E)	m/g)	1	day)	Value (g/m³)	(g/m³)	Adjustment	Adjustment	一	'RV (g/m²)	(g/kg-day)	Quotient	Quotient	Effect	Effect
11 12 12 13 14 15 15 15 15 15 15 15																
1992 1992 1994 1995	Immer roraging inn		1000	9	70 3E C	8	-	161	160	3.75	6.3E-04	2.1E-07	Ĺ	1.1E+00	2	Yes
Character Char		2000	200	315	:	8 6	:	19	160	3.75	6.3E-04	2.1E-07	:	5.4E-01	S	2
Fig. 1932 Fig. 169 375 63E-04 21E-07 13E-04 54E-02 No. My My My My My My My My		2024	200	3 2	4 SF-08	09	0.1	16	160	3.75	6.3E-04	2.1E-07		2.1E-01	2	No.
Charles Colored Charles TRV Chronic TRV Chroni		0000	2000	2 5	2 3E-08	9	0.1	16	160	3.75	6.3E-04	2.1E-07			2	S.
1902 11 10 11 11 12 13 14 15 15 15 15 15 15 15		0000	800	2 4	115.08	18	5	16	160	3.75	6.3E-04	2.1E-07	1.3E-04		2	S
1922 1922		00071		3 5	1 A AF	9	5 6	4	160	3.75	6.3E-04	2.1E-07	5.3E-05		2	S.
1982 Chronic Acute Troxicity Auto Chronic TRV Ch		00627		77	50	8	5	, u	180	3.75	6.3F-04	2.1E-07	2.7E-05			2
Acute Toxicity Value (g/kg)		35500	0.000	5	Z.3E-03	8	,	2	3	5	5					
The content of the	ai to Moliton of the	lo di para li p	Critical Study St	7887 la te noir												
Table Tabl	Cure critical effect is	s are minor lesi	ions of the heart. It	iver and lungs.	Critical Study: Driver	T TO										
Second Control Contr																
Page Page		Distance			Daily Chronic Intake Value (q/kg-	*Acute Toxicity	"Chronic Toxicity Value	Acute TRV Uncertainty	Chronic TRV Uncertainty	Acute			Acute Hazard	Chronic	Acute	Chronic
Figure Control Contr			Daily Acute Intak		day)	Value (g/kg)	(g/kg)	Adjustment	Adjustment	(g/kg)	Chronic	: TRV (g/kg)	Quotient	Quotient	Effect	Effect
6500 0 0100 2 6E-04 176 22 16 1600 110 14E-02 9 1E-02 9 1E-02 9 1E-02 9 1E-02 9 1E-02 9 1E-02 9 1E-02 9 1E-02 9 1E-02 9 1E-02 9 1E-02 9 1E-02 9 1E-02 9 1E-02 9 1E-02 9 1E-02 1 1E-02 9 1E-02 1 1E-02 9 1E-02 1 1E-02 9 1E-03 1 1E-02 9 1E-03 1 1E-02 9 1E-03 1 1E-02 9 1E-03 1 1E-02 9 1E-03 1 1E-02 9 1E-03 1 1E-02 9 1E-03 1 1E-03 9 1E-03 1 1E-03 9 1E-03 1 1E-03 9 1E-03 1 1E-03 9 1E-03 1 1E-03 1 1E-03 1 1E-03 1 1E-03 1 1E-03 1 1E-03 1 1E-03 1 1E-03 1 1E-03 1 1E-03 1 1E-03 1 1E-03 1 1E-03 1 1E-03 1 1E-03 1 1E-03 1 1E-03 1 1E-03 1 1E-04 1 1E-03 1 1E-03 1 1E-03 1 1E-03 1 1E-03 1 1E-03 1 1E-03 1 1E-03 1 1E-03 1 1E-03 1 1E-03 1 1E-03 <th< td=""><td>od soirces</td><td>doitag</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th<>	od soirces	doitag														
1.3E-04 176 22 16 1600 1.10 1.4E-02 1.5E-03 1.0E-03 1.0E-03 1.10 1.4E-02 1.10E-03 1.10 1.4E-02 1.10E-03 1.10E	inmer rotaging in	_		5	2 65-04	17.6	22	16	1600	1.10	-	4E-02	9.1E-03			£
5.2E-05 17.6 22 16 1600 110 14E-02 1.8E-03 1.8E-03 No <th< td=""><td></td><td>200</td><td></td><td>86</td><td>1.3E-04</td><td>17.6</td><td>22</td><td>16</td><td>1600</td><td>1.10</td><td>-</td><td>4E-02</td><td>4.5E-03</td><td></td><td></td><td>2</td></th<>		200		86	1.3E-04	17.6	22	16	1600	1.10	-	4E-02	4.5E-03			2
13E-05 176 22 16 1600 110 14E-02 91E-04 19E-04 No No No No 175 22 16 1600 110 14E-02 146-04 91E-04 No No No No No No No N		14000		2 2	5.2E-05	17.6	22	16	1600	1.10	-	4E-02	1.8E-03		ટ	٤
1.3E-06 176 22 16 1600 110 1.4E-02 4.5E-04 9.5E-04 No No No 1.5E-06 176 1.5E-04 1.0E-04 1.0E-04 1.0E-04 1.0E-04 1.0E-04 1.0E-04 1.0E-04 1.0E-04 1.0E-04 1.0E-04 No No No No No No No N		22000		12	2.6E-05	17.6	22	16	1600	1.10	-	4E-02	9.1E-04		ટ	ę
S_EE-06 176 22 16 1600 110 1.4E-02 1.8E-04 3.8E-04 No No Y. Chilical Sludy: Bramachari 1968 "Chronic TRV Chilical Sludy: Bramachari 1968 "Chronic TRV Chilical Sludy: Bramachari 1968 Acute Troxicity Value (g/kg) Acute TRV Chronic TRV Chronic TRV TRV TRV Hazard Acute Troxicity Value (g/kg) Acute Troxicity Value (g/kg) Acute TRV Chronic TRV TRV TRV Hazard Hazard Acute Effect (g/kg) Acute Troxicity Chronic TRV (g/kg) Acute Troxicity Chronic TRV (g/kg) Acute Troxicity Chronic TRV (g/kg) Acute Troxicity Chronic TRV (g/kg) Acute Troxicity Chronic TRV (g/kg) Acute Troxicity Chronic TRV (g/kg) Acute Troxicity Chronic TRV (g/kg) Acute Troxicity Chronic TRV (g/kg) Acute Troxicity Chronic TRV (g/kg) Acute Troxicity Chronic TRV (g/kg) Acute Troxicity Chronic Troxicity Chron		35500		5	1.3E-05		22	16	1600	1.10	-	4E-02	4.5E-04		2	S
§ EE-06 176 22 16 1600 110 14E-02 9.1E-05 1.9E-04 No No 9y. Critical Study: Bramachari 1958 "Chronic TRV (Branachari 1958) "Chronic TRV (Branachari 1958) Acute TRV (Branachari 1958) Chronic TRV (Branachari 1958) Acute TRV (Branachari 1950) Acute TRV (Branachari 1950) Acute TRV (Branachari 1950) Acute TRV (Branachari 1950) Acute TRV (Branachari 1950) Acute TRV (Branachari 1950) Acute TRV (Branachari 1950) Acute TRV (Branachari 1950) Acute TRV (Branachari 1950) Acute T		\$000¢		02	5.2E-06		22	16	1600	1.10	-	-	1.8E-04			2
397. Critical Study: Bramachari 1958 "Chronic Acute TRV Incertainty Eg/Gg and Property Incertainty Proxicity Value (g/kg) Chronic TRV (g/kg) Acute Acute Chronic TRV (g/kg) Acute Acute Chronic Effect (g/kg) Chronic TRV (g/kg) Acute Acute Chronic Effect (g/kg) Acute Acute Chronic Effect (g/kg) Acute Acute (g/kg) Acute (g/kg) <t< td=""><td></td><td>++00005</td><td></td><td>9</td><td>2.6E-06</td><td></td><td>22</td><td>16</td><td>1600</td><td>1.</td><td></td><td></td><td>9.1E-05</td><td></td><td>2</td><td><u>2</u>_</td></t<>		++00005		9	2.6E-06		22	16	1600	1.			9.1E-05		2	<u>2</u> _
y, Citical Study: Distillation of Education Study (gl/kg) **Chronic Acute TRV (binertainty (gl/kg)) Chronic TRV (gl/kg) Acute (gl/kg) Chronic TRV (gl/kg) Acute (gl/kg) Chronic TRV (gl/kg) Acute (gl/kg) Chronic TRV (gl/kg) Acute (gl/kg) Chronic TRV (gl/kg) Acute (gl/kg) Acute (gl/kg) Chronic TRV (gl/kg) Acute (gl/kg)						;		:				;				
Machine Mach	cute critical effects Chronic critical effer	are weight loss	and lesions of the inal irritation. Criti-	iver, spieen, ar	s 1989	:	9								.	
Daily Acute Skin Surface Dermally absorbed (g/kg-day) "-Chronic Toxicity Value (g/kg) Acute Toxicity Value (,												
Intake Value Skin Surface Dermally absorbed Acute Toxicity Value (g/kg) Acute Toxicity			Daily Acute				**Chronic	Acute TRV	Chronic TRV	Acute			Acute	Chronic	A 22.45	in Charles
Onto 0.026 2.8E-04 2 2.16 16 160 0.13 1.4E+00 8.0E-02 2.1E-04 No 0.0050 0.026 1.4E-04 2 2.16 1.6 160 0.13 1.4E+00 4.0E-02 1.0E-04 No 0.0050 0.026 2.8E-05 2 2.16 1.6 1.60 0.13 1.4E+00 4.0E-02 1.0E-04 No 0.0010 0.026 2.8E-05 2 2.16 1.6 1.60 0.13 1.4E+00 4.0E-02 1.1E-03 No 0.0010 0.0016 0.026 2.8E-05 2 2.16 1.6 1.60 0.13 1.4E+00 4.0E-03 2.1E-05 No 0.0010 0.0026 0.026 2.8E-05 2 2.16 1.6 1.60 0.13 1.4E+00 4.0E-03 2.1E-05 No 0.000 0.000 2.8E-05 2 2.16 1.6 1.60 0.13 1.4E+00 4.0E-03 4		Distance	Intake Value	Skin Surface	dose (ofko-day)	*Acute Toxicity Value (a/kg)	Toxicity Value (q/kg)	Uncertainty Adjustment	Uncertainty Adjustment	(g/kg)	Chroni	c TRV (g/kg)	Quotient	Quotient	Effect	Effect
0.0100 0.026 2.8E-04 2 216 16 160 0.13 1.4E+00 8.0E-02 2.1E-04 No 0.0050 0.026 1.4E-04 2 2.16 16 160 0.13 1.4E+00 4.0E-02 1.0E-04 No 0.0050 0.026 2.8E-05 2 2.16 16 160 0.13 1.4E+00 4.0E-02 1.0E-04 No 0.0010 0.026 2.8E-05 2 2.16 16 160 0.13 1.4E+00 8.0E-02 2.1E-05 No 0.0010 0.0026 0.026 2.8E-05 2 2.16 16 160 0.13 1.4E+00 8.0E-03 2.1E-05 No 0.0001 0.0002 0.026 2.8E-06 2 2.16 16 160 0.13 1.4E+00 4.0E-03 2.1E-05 No 0.0001 0.0002 2.8E-06 2 2.16 16 160 0.13 1.4E+00 4.0E-03 4.1E-05 </td <td></td> <td></td> <td>(1)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>,</td> <td></td>			(1)												,	
2.8E-04 2 2/16 16 100 0.13 1.4E-00 4.0E-02 1.0E-04 No 6.6E-05 2 2/16 16 160 0.13 1.4E+00 4.0E-02 1.0E-04 No 5.6E-05 2 2/16 16 160 0.13 1.4E+00 8.0E-03 2.1E-05 No 1.4E-05 2 2/16 16 160 0.13 1.4E+00 8.0E-03 2.1E-05 No 5.6E-06 2 2/16 16 160 0.13 1.4E+00 4.0E-02 4.1E-05 No 5.6E-06 2 2/16 16 160 0.13 1.4E+00 4.0E-03 4.1E-05 No 2.8E-06 2 2/16 16 160 0.13 1.4E+00 8.0E-04 2.1E-06 No 3.8E-06 2 2/16 16 160 0.13 1.4E+00 8.0E-04 2.1E-06 No	ummer Foraging De	rmal Absorption							7007			45,00	00 00		N.	2
1.4E-04 2 216 10 100 0.13 1.4E-00 4.0E-03 4.1E-05 No 2.8E-05 2 2.16 16 160 0.13 1.4E+00 8.0E-03 2.1E-05 No 1.4E-05 2 2.16 16 160 0.13 1.4E+00 4.0E-03 2.1E-05 No 5.6E-05 2 2.16 16 160 0.13 1.4E+00 4.0E-03 2.1E-05 No 2.8E-05 2 2.16 16 160 0.13 1.4E+00 4.0E-03 4.1E-05 No 2.8E-06 2 2.16 16 160 0.13 1.4E+00 8.0E-03 4.1E-06 No 3.8E-06 2 2.16 16 160 0.13 1.4E+00 8.0E-04 2.1E-06 No		6500					917		001		- (*	00-11-00	4 OE 03		2	Ş
5.6E-05 2 216 16 160 0.13 1.4E-00 8.0E-03 2.1E-05 No 1.4E-05 2 2.16 16 160 0.13 1.4E+00 4.0E-03 1.0E-03 No 5.6E-06 2 2.16 16 160 0.13 1.4E+00 4.0E-03 1.0E-05 No 2.8E-06 2 2.16 16 160 0.13 1.4E+00 1.0E-03 4.1E-06 No 3.8E-06 2 2.16 16 160 0.13 1.4E+00 8.0E-04 2.1E-06 No		8200					216		100		- -	45.00	1 65 00		2	2
2.0E-US 2 2 IOE-03 1.0E-03 1.0E-03 1.0E-03 1.0E-03 1.0E-03 No 1.4E-05 2 2 IOE-05 2 IOE-05 3 IOE-05 1.0E-03 4.1E-06 No 2.8E-06 2 2 IOE-05 1.0E-03 4.1E-06 No No 2.8E-06 2 2 IOE-05 1.0E-03 4.1E-06 No 3.MWI 1989 3 1.0E-03 4.1E-06 No		14000				The second secon	216		190	1		4F+00	8 OF-03	i	2	2
1.4E-US 2 216 16 160 0.13 1.4E+00 1.6E-03 4.1E-06 No 2.5E-06 2 2.1E-06 16 160 0.13 1.4E+00 8.0E-04 2.1E-06 No 3wis 1889		22000		į			710		190			4E+00	4 0F-03		2	2
2 8 E-06 2 2 216 16 160 0.13 1.4E+00 8.0E-04 2.1E-06 No wis 1889		35500					218		160			4E+00	1.6E-03	L	2	8
wis 1889		+00006					216		160			4E+00	8.0E-04		2	ş
Acute critical effect slight to moderate skin initiation. Critical Study: Palmer 1990 Chronic critical effects are well defined enythema and edema. Critical Study: Lewis 1989		++00000					2									
Chronic critical effects are well defined enythema and edema. Critical Study: Lewis 1989	Acute critical effect :	light to moderal	te skin irritation. C	ritical Study: Pa	lmer 1990											
	Chronic critical effe	cts are well defin	ned erythema and	edema. Critica	Study: Lewis 1989	_										

Gray bat risk characterization for fog oil exposure under Pasquill Category D.

	Distance (m)	Daily Acute Intake Value (g/m³)	ntake Value	Daily Chronic Intake Value (g/kg- day)	**Chronic **Chro	**Chronic Toxicity Value	Acute TRV Uncertainty Adjustment	Chronic TRV Uncertainty	Acute TRV	Chronic TDV (24m ³)	Chronic Dose Adjusted TRV	Acute Hazard	Chronic Hazard	Acute	Chronic
								Т		TIME AND	(g/kg-day)	Cuotient	Quotient	E11901	Effect
Maternity Cave Inhalation	ion											1			
Saltpeter #3	3682	0.01	-	5.4E-07	09	0.1	16	160	2.75	E 3E 04	2 45 07	4 20	00.700		
Freeman	12547	00.0	0	0.0E+00	09	0.1	16	3	375	S.3C.02	2.15-07	1.00-03	Z.0E+00 No		Yes
							2	3	2	9.35-04	7.1E-07	1.3E-04	O.UE+UU NO		0
*Acute critical effect is oil pneumonia. Critical Study: Shinn et al. 1987	oil pneumonia.	Critical Study: St	hinn et al. 1987							+		1			
*Chronic critical effects are minor lesions of the heart, liver and lungs. Critical Study: Driver	s are minor les	ions of the heart, I	iver and lungs.		et al. 1992					+		-			
							-		T	+					
		Daily Acute													
	Distance		Skin Surface	Skin Surface Dermally absorbed	*Acute Toxicity	**Chronic	Acute TRV	Chronic TRV	Acute			Acute	Chronic		
	(m)	(g/m²)	Area (m²)	dose (g/kg-day)	Value (g/kg)	(g/kg)	Adjustment	Adjustment	(a/kg)	Chronic	Chronic TRV (a/kg)	Displant	Hazard	Acute	Chronic
											6.6		╁		
Maternity Cave Dermal Absorption	Absorption												+		
Saltpeter #3		0.0100	0.0260	2.8E-04	2	216	16	160	0 13		4E+00	S OF O	2 45 04 No		
Freeman	12547	0.0020	0.0260	5.6E-05	2	216	16	160	0.13	-	4F+00	1 6F-02			
												70.1			
*Acute critical effect slight to moderate skin irritation. Critical Study: Palmer 1990	ght to moderate	skin irritation. Cr	ritical Study: Pal	mer 1990								1			
"Chronic critical effects are well defined erythema and edema. Critical Study: Lewis 1989	s are well defir	ed erythema and	edema. Critical	Study: Lewis 1989											
														-	

Gray bat risk characterization for fog oil exposure under Pasquill Category E.

Static Sillore			ļ			The second of the		10 F -1 -1 -1 C			Chronic Does	Acrite	Chronic		
	Distance	Daily Acute Intake Value		Daily Chronic Intake Value (g/kg- dav)	*Acute Toxicity Value (g/m³)	Toxicity Value (g/m³)	Acute 1RV Uncertainty Adjustment	Uncertainty Adjustment	TRV (g/m³)	Chronic TRV (g/m³)	Adjusted TRV (g/kg-day)	Hazard	Hazard Quotient	Acute Effect	Chronic Effect
							,								
Summer Foraging Inhalation	alation										20 17 0	0 11	4 45+00	Alo	×
	4000	0.0100	8	2.3E-07	8	0.1	16	160	3.73	5.00	2.15-07			2 2	3 2
	2000	0.0050	20	1.16-07	9	0.1	16	160	3.75	0.35-04	7.1E-0/		2010	2 2	2 2
	0006	0.0020	Q;	4.5E-08	09	0.1	16	160	3.75	6.3E-04	2.1E-0/			2 2	2 4
	14000	0.0010	9	2.3E-08	09	0.1	16	160	3.75	6.3E-04	2.1E-0/			2	2 2
	24000	0.0005	35	1.16-08	9	0.1	16	160	3.75	6.3E-04	2.1E-07		5.4E-02	2	2
	20000		2	4.5E-09	9	0.1	16	160	3.75	6.3E-04	2.1E-07	5.3E-05		2	2
	10000		7	2.3E-09	09	0.1	16	160	3.75	6.3E-04	2.1E-07	2.7E-05	ļ	2	2
	100000														
uto critical offect is	i oil poeumonia	Acute critical effect is oil poetimonia. Critical Study: Shinn et al. 1987	hinn et al. 1987												-
bronic critical effect	4s are minor les	ions of the heart. It	iver and lungs.	**Chronic critical effects are minor lesions of the heart. liver and lungs. Critical Study. Driver et	et al. 1992										
TO INC. CHIEF OF THE PRINCE	201 5011111 615 615	100		,											
	Dietance			Daily Chronic Intake Value (g/kg-	*Acute Toxicity	**Chronic Toxicity Value	Acute TRV Uncertainty	Chronic TRV Uncertainty	Acute TRV			Acute Hazard	Chronic	Acute	Chronic
		Daily Acute Intake Value (g/kg)	(e Value (g/kg)	day)	Value (g/kg)	(g/kg)	Adjustment	Adjustment	(g/kg)	Chron	Chronic TRV (g/kg)	Quotient	Quotient	Effect	Effect
Summer Foraging Ingestion	Destion	0000	Ş	2 RE-DA	17.6			1600	1.10		.4E-02	9.1E-03	!	2	ş
	300		3 6	135.04				1600	1.10	-	1.4E-02	4.5E-03	9.5E-03	S S	ટ
	10000		36	5 2F-05	,	22	16	1600	1.10		1.4E-02	1.8E-03		<u>و</u>	2
	3000		10	2.6E-05					1.10	τ-	1.4E-02	9.1E-04		2	2
	2000		05	1.3E-05	17.6		16		1.10	-	1.4E-02	4.5E-04		2	2
	+00005		02	5.2E-06	17.6				- 2	1	1.4E-02	1.8E-04	3.85-04	2	2
	\$0000+		10	2.6E-06				1600	- 5		1.4E-02	9.1E-05		ON.	2
				0 1 1 1 1	0.1	03									
rute critical effects	are weight loss	and lesions of the	Iver, spieen, ar	*Acute critical effects are weight loss and lesions of the liver, spieen, and kidney. Critical Study		920									
thronic critical effe	ct is gastrointes	*Chronic critical effect is gastrointestinal irritation. Critical Study: Lewis 1989	ical Study: Lewi	s 1989											
		Daily Acute				**Chronic	Acute TRV	Chronic TRV	Acute			Acute	Chronic		
	Distance	Intake Value	Skin Surface	Dermally absorbed	*Acute Toxicity	Toxicity Value	Uncertainty	Uncertainty	TRV (a/kg)	Chron	Chronic TRV (a/kg)	Hazard	Hazard Quotient	Acute	Chronic
	Ē	(mg)	Area (III.)	(App-Bu/B) seon	(Bus) on ma	(Rush)									
Summer Foraging Dermal Absorption	ermal Absorption								İ		707	8 OF 02		No	Š
	7500							,	2 0		45.00	A OF O	1 OF-04	N	2
	10000										1.4 A T T T T T T T T T T T T T T T T T T	1 65 00		S	S
	18000					216	16		1		1.40	8 OF 03	-	2 2	2 2
	30000				:		***		1	1	200	4 000	i	2 2	2
	20000				2			160	0.13		1.45+00	4.0E-03			2
	\$0000÷	0.0002				216	2				11.00	200			2
	++00005	0.0001	0.026	2.8E-06				160	-		1.45+00	0.00	Z. 15-02		2
				4000									-	:	:
cute critical effect	is slight to mode	*Acute critical effect is slight to moderate skin irritation. Critical Study. Paimer 1990	Critical Study.	*Acute critical effect is slight to moderate skin irritation. Critical Study. Paimer 1990											
The lasting almost	The part of the part	THE PROPERTY OF THE PARTY.		The state of the s											

Gray bat risk characterization for fog oil exposure under Pasquill Category E.

		Daily Acrete Intoke Vature			1	"Chronic	Acute TRV	Chronic TRV	Acute		Chronic Dose	Acute	Chronic		
	DISTANCE	Daily Acute III		-6y/6	Acute loxicity Toxicity Value	Toxicity Value	Uncertainty	Uncertainty	TRV	Chronic	Adjusted TRV	Hazard	Hazard	Acute	Chronic
	Ê	(a/m²)	٠,	day)	Value (g/m³)	(g/m³)	Adjustment	Adjustment	(d/m²)	TRV (a/m³)	(a/ka-dav)	Ouotient	Ountient	Fffert	Effect
									Т						
Maternity Cave Inhalation	-Fo									1			1		
Sattpeter #3		0.0		1.16-06	09	5	4	180	3.75	6 26 04	100	i	100	1	
Freeman	12547	80		0.05	8	100	2 4	201	5 1	1000	70-11-07		3.ZE+00 No		Yes
				3	3	5	2	92	3.75	6.3E-04	2.1E-07	2.7E-04	0.0E+00 No		0
*Acute critical effect is oil pneumonia Critical Study: Shinn et al. 1987	il pneumonia	Critical Study: Sh	inn et et 1987												
"Chronic critical effects are minor lesions of the heart liver and lives Ordinal Chief.	: are minor les	ine of the heart liv	or and hade		4,000										
		and the state of t	יפו מונים ומומים.		et al. 1992										
													-		
	Dietance	Daily Acute Intake Value	Skin Surface				Acute TRV	Chronic TRV	Acute			Acute	Chronic		T
	E)		Area (m²)	Area (m²) dose (g/kg-day)	-Acute Toxicity Value (a/ka)	Toxicity Value	Uncertainty	Uncertainty	TRV	o Jacob C	Change TBV (effect)	Hazard	Hazard		Chronic
						16.61		Walling The Control	(Guille)		(By/B) AVI	Cuonent	Chothent	ETTBCT	Effect
Maternity Cave Dermal Absorption	Absorption													-	
Saltpeter #3			0.0260	2.8E-04	2	216	16	160	0 13		4F+00	SOE OF	O 4E OA NO		
Freeman	12547	0.0020	0.0260	5.6E-05	2	216	19	160	0 13		45+00	4 85 03	4.4E.0E NO		2
							2	2	3	-	1F100	1.05-02	4. IE-03 N		0
*Acute critical effect is slight to moderate skin irritation, Critical Study: Palmer 1990	slight to moder	ate skin irritation. (Critical Study: F	Palmer 1990											
**Chronic critical effects are well defined enythema and edema. Critical Study: Lewis 1989	s are well defin	ed erythema and e	dema. Critical	Study: Lewis 1989										Ť	

Attachment G: Fog Oil - Mobile Smoke

Gray bat risk characterization for fog oil exposure under Pasquill Category B.

Mobile Smoke															
	Distance			Dally Chronic Intake	*Acute Toxicity	Toxicity Value	Acute TRV	Chronic TRV	Acute	Chronic	Chronic Dose	Acute	Chronic	7	1
	(£	Dally Acute Intake Value (g/m³)		Value (g/kg-day)	Value (g/m³)	(g/m³)	Adjustment	Adjustment		TRV (g/m³)	(g/kg-day)	Quotient	Quotient	Effect	Effect
Summer Foraging inhalation	J														
	000		Q	1.3E-06	8	0.1		160	3.75	6.3E-04	2.1E-07		6.4E+00 No		Yes
	4000		Q	6.7E-07	8	0.1		160	3.75	6.3E-04	2.1E-07	1.3E-03			Yes
	4000		٥	2.7E-07	8	0.1	16	160	3.75	8.3E-04	2.1E-07			Γ	Yes
	2000		0	1.35-07	9	0.1		160	3.75	6.3E-04	2.1E-07	L	L		Š
	2000		2	6.7E-08	9	0.1		160	3.75	6.3E-04	2.1E-07	1.3E-04			ş
	7000		2	2.7E-08	9	0.1	16	160	3.75	6.3E-04	2.1E-07	L			ę
	0006	0.001	-	1.3E-08	09	0.1		160	3.75	6.3E-04	2.1E-07	L	6.4E-02 No		S.
1 1													Ц		
Acute critical effect is oil pheumonia. Critical Study: Shinn et al. 1987	pheumonia.	Critical Study: Shin													-
**Chronic critical effects are minor lesions of the heart, liver, and lungs.	are minor lesic	ons of the heart, liver		Critical Study: Driver et a	al. 1992										
	and the late			o de la constanta de la consta	11-11-11-11-11-11-11-11-11-11-11-11-11-	Chronic	Acute TRV	Chronic TRV	Acute			Acute	Chronic		
	(E)	Dally Acute Intake Value (g/kg)		Value (o/ko-dav)	Value (a/kg)	l oxicity value	Adlustment	Oncertainty) (2) (2)	oleone.	Chronic TDV (n/km)	Hazard	Hazard	Acute	Chronic
				(for Burk)	Su. Si	(Ruja)	Ningilla Ballance	Winning To			(Suid) Au	111000	III III	בוופרו	
Summer Foraging Ingestion	uo,								<u> </u>						
	4000	0.0100	6	9.3E-07	17.6	22	16	1600	4 15	-	1 4E-02	0 1E.03	A SE OF		02
	2000	0.0050	6	4.75-07	17 A	32	â	1600	5		£.03	4 5E 03			2 9
	9009		0	1.96-07	17.6	22	19	1600	100	-	1 4F-02	1 8E-03	l		2 2
	7500		6	9.35-08	17.6	3	4	1600	5	-	4 4E_02	0 4F 04		Ī	2
	9500		2	4.7E-08	17.6	22	16	1600	2 9	-	1.4F-02	4 5F.04	3.4F.06 No	T	2 2
	14500		2	1.9E-08	17.6	22	16	1600	1.10	-	1,4E-02	1.8E-04			9
	8500		1	9.3E-09	17.6	22	19	1600	1.10		1,4E-02	9.1E-05		Γ	
"Acute critical effects are weight loss and lesion of the liver, spleen, and kidney.	weight loss ar	nd lesion of the liver,	, spleen, and kid	Critical Study:	Bramachari 1958										
**Chronic critical effect is gastrointestinal irritation. Critical Study: Lewis 1989	gastrointestin	al irritation. Critical	Study: Lewis 19							-				İ	
		-	-			**Chronic	Acute TRV	Chronic TRV	Acute			Acute	Chronic		
	Distance	3	*	Dermaily absorbed	*Acute Toxicity	Toxicity Value	Uncertainty	Uncertainty	TR.			Hazard	Hazard	Acute	Chronic
	Ē	(a/m²)	Area (m²)	dose (g/kg-day)	Value (g/kg)	(g/kg)	Adjustment	Adjustment	(g/kg)	Chronic	Chronic TRV (g/kg)	Quotient	Quotlent	Effect	Effect
Summer Formalina Dermal Absorption	Absorption								1					Ī	
	4000	0.0100	0.0260	1.0E-03	2	216	16	160	0.13	-	45+00	8 0E-02	7.4F-04 N	o _N	CN.
	2000		0.0260	5.0E-04	2	216	16	160	0.13	-	1.4E+00	4.0E-02	3.7E-04		No
	0009		0.0260	2.0E-04	2	216	16	160	0.13	-	1.4E+00	1.6E-02			No No
	7500		0.0260	1.0E-04	2	216	16	160	0.13	ř	1.4E+00	8.0E-03		Γ	9
	9500		0.0280	20-30 9	2	216	9	160	0.13	-	1.4E+00	4.0E-03		Γ	9
	14500		0.0260	2.0E-05	2	216	9	160	0.13	1,1	1.4E+00	1.6E-03			9
	8500	0.0001	0.0260	1.0E-05	2	216	91	160	0.13	+	1.4E+00	8.0E-04	7.4E-06 No		No
"Acute critical effect is slight to moderate skin irritation. Critical Study: Palmer 1990	ont to modera	te skin irritation. Crit	tical Study: Paln	ner 1990											
Chronic critical effects are well defined erythema and edema. Critical Study: Lewis 1989	are well define	d erythema and ede	ma. Critical Stu-	dy: Lewis 1989						1					

Gray bat risk characterization for fog oil exposure under Pasquill Category B.

Daily Acute in table Value (gims) Daily Acute in table Value (gims) Acute Tooling Chronic Intellet Value (gims) Acute Tooling Chronic Intellet Value (gims) Acute Tooling Chronic Intellet Value (gims) Acute Tooling Chronic Intellet Value (gims) Acute Tooling Chronic Intellet Value (gims) Acute Tooling Chronic Intellet Value Tooling								25.50				Chronic Door	40000			
Charles Carrolle		Oletano.		_	Dally Chronic Intake	<u>. </u>		Uncertainty	Uncertainty	TRV	Chronic	Adjusted TRV	Hazand	Caronic	-	
The control of the			Dally Acute Intak	(e Value (g/m²)	Value (g/kg-day)	Value (g/m³)	(a/m ₃)	Adjustment	Adjustment	_	TRV (g/m³)	(g/kg-day)	Quotlent	Quotient	Effect	ביים ביים
Secondary Seco	Maternity Cave Inhalatic									T						
Secondary Seco	Musgrave Hollow															
Secondary Seco	Saltmater #7															
	A language			0.	3.2E-07				160	3.75	8 36 04	20 45 07	1			
Control Cont	reema			8	0.05+00				200	3	0.35	7.15-07				Yes
Secondary Seco	Bally McCann Hollow								201	3.75	6.3E-04	2.1E-07	ļ	0.0E+00		ş
Section Sect	Saltpeter #3			00	3.04.06											
SE-06 Color Colo	Freeman			2	00100				160	3.75	6.3E-04	2.1E-07				Yes
Fe-06 Fe-07 Fe-07 Fe-08 Fe-09 Fe-0	Aush Paddle Hollow				20.700			9	160	3.75	6.3E-04	2.16-07	L.	Ì		و
Secondary Seco	Saltpeter #3		0000	2	20 13 0								ı		Ī	
Fe-00 60 0.1 16 160 3.75 6.3E-04 2.1E-07 0.0E+09 0.0E+09 No No No Fe-00 E-00 No No E-00 E-00 0.0E+09 No No No E-00 E-00 0.0E+09 No No No E-00 0.0E+09 No No No E-00 0.0E+09 No No No E-00 0.0E+09 No No No No E-00 0.0E+09 No No No E-00 0.0E+09 No No No E-00 0.0E+09 No No No E-00 0.0E+09 No No No E-00 0.0E+09 No No No E-00 0.0E+09 No No No E-00 0.0E+09 No No No E-00 0.0E+09 No No E-00 0.0E+09 No No E-00 0.0E+09 No No E-00 0.0E+09 No No E-00 0.0E+09 No No E-00 0.0E+09 No No E-00 0.0E+09 No No E-00 0.0E+09 No No E-00 0.0E+09 No No E-00 0.0E+09 No No E-00 0.0E+09 No No E-00 0.0E+09 No No E-00 0.0E+09 No No E-00 0.0E+09 No No E-00 0.0E+09 No No E-00 0.0E+09 No No E-00 0.0E+09 No No E-00 0.0E+09 No No E-00 No No E-00 No No E-00 No No E-00 No No E-00 No No E-00 No No E-00 No No E-00 No No E-00 No No E-00 No No E-00 No No E-00 No No E-00 No No E-00 No No E-00 No No E-00 No No No E-00 No No E-00 No No E-00 No No E-00 No No E-00 No No E-00 No No E-00 No No E-00 No No E-00 No No E-00 No No E-00 No No No No No No No	Freeman			2 5	7.3E-Ub			16	160	3.75	6.3E-04	2.1E-07			T	
Fe-fo 60	Sallard Hollow			2	0.0E+00	9		16	160	3.75	6.3E-04	2 1E-07	1		T	8
Name Colored Name	Saltrafar #3												1		T	١
				2	0.0E+00			16	160	3.75	R 3E A4	70 24 6				
Value (g/kg) Valu	Liceman			0	0.0E+00			16	150	3.75	6 25 04	2.15-0/	_	ı		او
The content of the first of t								2	3	9,70	0.3E-04	Z.1E-0/				ş
The content of the	Acute critical effect is o	il pneumonia. C	Critical Study: Shin	in et al. 1987												
Total Toxicity Toxicity Value Uncertainty TRV TRV Hazard Haza	Chronic critical effects	are minor lesion	ns of the heart, liver	r, and lungs. Cri	tical Study: Driver et a	1 1992										
Packet Foxiety Text																
The content of the file of the content of the con			Daily Active												Ť	
Part Poxicity Toxicity Value Uncertainty TRV Chronic TRV (g/kg) Chronic TRV (g/			-				"Chronic	Acute TRV	Chronic TRV	Acute			-			
ay) Value (g/kg) (g/kg) Adjustment Adjustment (g/kg) Chronic TRV (Clarance	-		Dermally absorbed	*Acute Toxicity	Toxicity Value	Uncertainty	Uncertainty	TRV			Paratel			
Feb. Feb.			(g/m)	Area (m²)	dose (g/kg-day)	Value (g/kg)	(g/kg)	Adjustment	Adjustment	(a/ka)	Chronic	TRV(c/kg)	o di o di			ביים שוכי
E-04 2 216 16 160 0.13 1.4E+00 1.6E-02 1.5E-04 No E-04 2 216 16 160 0.13 1.4E+00 1.6E-02 1.5E-04 No E-04 2 216 16 160 0.13 1.4E+00 1.6E-02 5.5E-04 No E-04 2 216 16 160 0.13 1.4E+00 1.6E-03 1.1E-05 No E-05 2 216 16 160 0.13 1.4E+00 8.0E-02 4.6E-04 No E-05 2 216 16 160 0.13 1.4E+00 1.6E-03 7.4E-06 No E-05 2 216 16 160 0.13 1.4E+00 1.6E-03 7.4E-06 No E-05 2 216 16 160 0.13 1.4E+00 1.6E-03 7.4E-06 No E-05 2 216 16 160 0.13 1.4E+00 1.6E-03 7.4E-06 No E-05 2 216 16 160 0.13 1.4E+00 1.6E-03 7.4E-06 No E-05 2 216 16 160 0.13 1.4E+00 1.6E-03 7.4E-06 No E-05 2 216 16 160 0.13 1.4E+00 1.6E-03 7.4E-06 No E-05 2 216 16 160 0.13 1.4E+00 1.6E-03 7.4E-06 No E-05 2 216 16 160 0.13 1.4E+00 1.6E-03 7.4E-06 No E-05 2 216 16 160 0.13 1.4E+00 1.6E-03 7.4E-06 No E-05 2 216	Annual Course Course									+	-	(Au A	The later of the l	Cuonent	Ellect	Effect
Fe-04 2 216 16 160 0.13 1.4E+00 1.6E+02 1.5E+04 No Fe-04 2 216 16 160 0.13 1.4E+00 1.6E+02 1.5E+04 No Fe-04 2 216 16 160 0.13 1.4E+00 1.6E+03 1.1E+05 No Fe-04 2 216 16 160 0.13 1.4E+00 1.6E+03 1.1E+05 No Fe-05 2 216 16 160 0.13 1.4E+00 1.6E+03 1.1E+05 No Fe-05 2 216 16 160 0.13 1.4E+00 1.6E+03 7.4E+06 No Fe-05 2 216 16 160 0.13 1.4E+00 1.6E+03 7.4E+06 No Fe-05 2 216 16 160 0.13 1.4E+00 1.6E+03 7.4E+06 No Fe-05 2 216 16 160 0.13 1.4E+00 1.6E+03 7.4E+06 No Fe-05 2 216 16 160 0.13 1.4E+00 1.6E+03 7.4E+06 No Fe-05 2 216 16 160 0.13 1.4E+00 1.6E+03 7.4E+06 No Fe-05 2 216 16 160 0.13 1.4E+00 1.6E+03 7.4E+06 No Fe-05 2 216 16 160 0.13 1.4E+00 1.6E+03 7.4E+06 No Fe-05 2 216 16 160 0.13 1.4E+00 1.6E+03 7.4E+06 No Fe-05 2 216 16 160 0.13 1.4E+00 1.6E+03 7.4E+06 No Fe-05 2 216 16 160 0.13 1.4E+00 1.6E+03 7.4E+06 No Fe-06 2 216 16 160 0.13 1.4E+00 1.6E+03 7.4E+06 No Fe-07 2 216	atelliny Cave Dermai A	psorption														
	usgrave Hollow									+						
E-05 2 2 6 16 16 16 16 16	Saltpeter #3		0.0020	0.0260	2.0E-04	6	240		1							
FE-04 2 216 16 160 0.13 1.4E+00 1.6E-03 1.6E-05 No FE-04 2 216 16 160 0.13 1.4E+00 1.6E-03 1.1E-05 No FE-04 2 216 16 160 0.13 1.4E+00 1.6E-03 1.1E-05 No FE-05 2 216 16 160 0.13 1.4E+00 1.6E-03 7.4E-06 No FE-05 2 216 16 160 0.13 1.4E+00 1.6E-03 7.4E-06 No FE-05 2 216 16 160 0.13 1.4E+00 1.6E-03 7.4E-06 No FE-05 2 216 16 160 0.13 1.4E+00 1.6E-03 7.4E-06 No FE-05 2 216 16 160 0.13 1.4E+00 1.6E-03 7.4E-06 No FE-05 2 216 16 160 0.13 1.4E+00 1.6E-03 7.4E-06 No FE-05 2 216 16 160 0.13 1.4E+00 1.6E-03 7.4E-06 No FE-05 2 216 16 160 0.13 1.4E+00 1.6E-03 7.4E-06 No FE-05 2 216 16 160 0.13 1.4E+00 1.6E-03 7.4E-06 No FE-05 2 216 16 160 0.13 1.4E+00 1.6E-03 7.4E-06 No FE-05 2 216 16 160 0.13 1.4E+00 1.6E-03 7.4E-06 No FE-05 2 216 16 160 0.13 1.4E+00 1.6E-03 7.4E-06 No FE-05 2 216 16 160 0.13 1.4E+00 1.6E-03 7.4E-06 No FE-05 2 216 16 160 0.13 1.4E+00 1.6E-03 7.4E-06 No FE-05 2 216 16 160 0.13 1.4E+00 1.6E-03 7.4E-06 No FE-05 2 2 2 2 2 2 2 2 2	Freeman		0.0002	0.0260	2.0F-05	-	246	9	201	0.13	-	4E+00	1.6E-02	1.5E-04 N		0
E-04 2 216 16 60 0.13 1.4E+00 8.0E-02 5.5E-04 No E-05 2 216 16 160 0.13 1.4E+00 1.6E-03 1.1E-05 No E-04 2 216 16 16 0.13 1.4E+00 8.0E-02 4.6E-04 No E-05 2 216 16 160 0.13 1.4E+00 1.6E-03 7.4E-06 No E-05 2 216 16 160 0.13 1.4E+00 1.6E-03 7.4E-06 No E-05 2 216 16 160 0.13 1.4E+00 1.6E-03 7.4E-06 No	ally McCann Hollow					•	7	2	160	0.13	+	£ +00	1.6E-03	1.5E-05 N		٥
F-05 2 216 16 160 0.13 1.4E+00 8.0E-02 5.5E-04 No No No No No No No N	Saltpeter #3		0.0100	0.0260	7.5E.04	c	18									
Fe-04 2 216 16 160 0.13 1.4E+00 1.6E-03 1.1E-05 No Fe-04 2 216 16 160 0.13 1.4E+00 8.0E-02 4.6E-04 No Fe-05 2 216 16 160 0.13 1.4E+00 1.6E-03 7.4E-06 No Fe-05 2 216 16 160 0.13 1.4E+00 1.6E-03 7.4E-06 No Fe-05 2 216 16 160 0.13 1.4E+00 1.6E-03 7.4E-06 No Fe-05 2 2 2 2 2 2 2 2 2	Freeman		0.0002	0 0260	4 KE OK	7	710	91	9	0.13	+	4E+00	8.0E-02	5.5E-04 N	Γ	٥
EE-04 2 216 16 160 0.13 1.4E+00 8.0E-02 4.6E-04 No No EE-05 2 2.16 16 160 0.13 1.4E+00 8.0E-02 4.6E-04 No No No 2 2.16 16 160 0.13 1.4E+00 1.6E-03 7.4E-06 No No 2 2.16 16 160 0.13 1.4E+00 1.6E-03 7.4E-06 No	ush Paddle Hollow				1.05.00	7	216	9	160	0.13		4E+00	1.6E-03	1.1E-05 N		٥
F-06 2 216 16 160 0.13 1.4E+00 8.0E-02 4.6E-04 No F-06 2 216 16 160 0.13 1.4E+00 1.6E-03 7.4E-06 No F-05 2 216 16 160 0.13 1.4E+00 1.6E-03 7.4E-06 No F-06 2 216 16 160 0.13 1.4E+00 1.6E-03 7.4E-06 No F-06 1.6E-03 7.4E-06 No F-06 1.6E-03 7.4E-06 No F-07 1.6E-03 7.4E-06 No F-08 1.6E-03 7.4E-06 No F-09 1.6E-03 7.4E-06 No F-09 1.6E-03 7.4E-06 No F-09 1.6E-03 7.4E-06 No F-09 1.6E-03 7.4E-06 No F-09 1.6E-03 7.4E-06 No F-09 1.6E-03 7.4E-06 No F-09 F-09 1.6E-03	Saltpeter #3		0.0100	0 0260	8.2E.04	,								 		
14E+00 15E-04 14E+00 15E-04 14E+00 15E-05 14E+00 15E-05 14E+00 15E-05 14E+06 15E-05 14E+06 15E-05 14E+06 15E-05 14E+06 15E-05 14E+06 15E-05 14E+06 15E-05 14E+06 15E-05 14E+06 15E-05 14E+06 15E-05 14E+06 15E-05 14E+06 15E-05 14E+06 15E-05 14E+06 15E-05 14E+06 14E-06 1	Freeman		0.0001	0.0260	8 2E 06	4 6	917	10	9	0.13	+	4E+00	8.0E-02	4.6E-04		٥
E-05 2 216 16 160 0.13 1.4E+00 1.6E-03 7.4E-06 No	allard Hollow				0.45-00	7	216	16	160	0.13	÷	(E+00	8.0E-04	4.8E-06 N		
E-05 2 216 16 160 0.13 1.4E+00 1.6E-03 7.4E-06 No 1.6E-05 7.4E-06 NO 1.6E-05 7.4E-06 NO 1.6E-05 7.4E-06 NO 1.6E-05 7.4E-06 NO 1.6E-05 7.4E-06 NO 1.6E-05 7.4E-06 NO 1.6E-05 7.4E-06 NO 1.6E-05 7.4E-06 NO 1.6E-05 7.4E-06 NO 1.6E-05 7.4E-06 NO 1.6E-05 7.4E-05 7.4E	Saltpeter #3		0.0002	0.0260	1 0F.05	6	950	,		-						
1.6E-03 7.4E-06 No 1.6E-03 7.4E-05 No 1.6E-03 7.4E-05 No 1.6E-03 7.4E-05 No 1.6E-03 7.4E-05 No 1.6E-03 7.4E-05 No 1.6E-03 7.4E-05 No 1.6E-03 7.4E-05 No 1.6E-03 7.4E-05 No 1.6E-03 7.4E-05 No 1.6E-03 7.4E-05 No 1.6E-03 7.4E-05 No 1.6E-03 7.4E-05 No 1.6E-03 7.4E-05 No 1.6E-03 7.4E-05 No 1.6E-03 7.4E-05 No 1.6E-03 7.4E-05 No 1.6E-03 7.4E-05 No 1.6E-03 7.4E-05 No 1.6E-03 7.4E-03	Freeman		0.0002	0.0260	30 30	1	017	2	160	0.13	<u>-`</u>	£±60	1.6E-03	7.4E-06 N		٥
					20.1	7	216	16	160	0.13	1.	€+00	1.6E-03	7.4E-06 N		
Chronic critical effects are well defined enythema and edema. Critical Study: Lewis 1989	Cute critical effect is sik	oht to moderate	skin irritation Crit	tinal Childre Dale	4000										Ī	
The state of the s	Chronic critical effects	are well defined	enthema and ede	ma Critical Chic	190 1990											
				CIECAL CIEC	dy. Lewis 1909										Ť	
															1	

Gray bat risk characterization for fog oil exposure under Pasquill Category C.

Mobile Smoke			-							_					
						- Chronic	Acute TRV	Chronic TRV	Acute		Chronic Dose	Acute	Chronic		
	(m)	Daily Acute Intake Value (g/m³)		Value (g/kg-day)	Value (g/m²)	loxicity value (g/m²)	Oncertainty	Uncertainty	(m/b)	TRV (g/m³)	Adjusted TRV (g/kg-dav)	Hazard	Hazard Quotient	Acute	Chronic
Summer Foraging inhalation	ation								Ī						
		0.0100		1.3E-06	8	0.1	16	160	3.75	6.3E-04	2.1E-07	1		9	Yes
	3000			6.7E-07	8	0.1	16	160	3.75	8.3E-04	2.1E-07	1.3E-03	3.2E+00 No	و	Yes
	3000			2.7E-07	09	0.1	91	160	3.75	8.3E-04	2.1E-07				Yes
	4500			1.3E-07	09	0.1	16	160	3.75	6.3E-04	2.15-07				2
	6500			8.7E-08	9	0.1	91	160	3.75	6.3E-04	2.1E-07	L			2
	9500			2.7E-08	9	0.1	16	160	3.75	6.3E-04	2.1E-07				S
	14000	0.0001		1.3E-08	9	0.1	16	160	3.75	6.3E-04	2.1E-07	l	ŀ		ş
*Acute critical effect is o	Il pneumonia.	*Acute critical effect is oil pneumonia. Critical Study: Shinn et al. 1987	1. 1987												
**Chronic critical effects	are minor lesi	*Chronic critical effects are minor lesions of the heart, liver and lungs. Critical Study: Driver et	lungs. Crit		al. 1992										
						Chronic	Acute TRV	Chronic TRV	Acute			Acute	Chronic		
	Olstance	Date & sector bedanks before	_	Dally Chronic Intake	*Acute Toxicity	Toxicity Value	Uncertainty	Uncertainty	TRV	i		Hazard	Hazard	Acute	Chronic
		Carly Acute intake Value (ging)	(Suis)	Value (g/kg-day)	Value (g/kg)	(8/48)	Aajustment	Adjustment	(g/kg)		Chronic IRV (g/kg)	Cuotient	Cuotient	ETIOCI	EMeci
Summer Foreging Indestion	do														
	3000	00100	\mid	9.35.07	17.6	3	45	1800	5	ľ	4E.03	0 45 03	20 25 2	ş	1
	4000		İ	1 75 07	9.7.6	5	9	2004			20 17 7	2013	200		2
	5000			1 95.07	47.6	27	2 4	1600	2 5	- -	1.45-02	4.05-03	3.40-05	T	2 2
	8500			00 30 00	3.1.4	ç	9	0007			20 20	10.0	LO		2
	12000		T	9.35-00	47.6	27	9	000+	2 5		1.45-02	9.10.0	0.0E-00 NO		NO.
	24000		l	90.00	2,0	77 6	9	000	2 9		46.00	10.00		T	2
	20007			00-100	0.7.	77	2	200	2 !		1.4E-UZ	1.05-04	ON 00-14-	Ī	2
	300		1	80-115.B	1/.0	77	16	1600	1.10		4E-02	9.1E-05			9
Acide oritical offects ar	a manipulation of	4 1000000000000000000000000000000000000	7	7	4000										
Acute crucel ellects at	e weight loss a	Acute crucal effects are weight toss and lesons of the iver, spieen, and kidney.	een, and Ki	Critical Study.	Bramachan 1958				1						
Chionic cracel ellect	S dasnointestil	Chronic critical effect is gastrointestinal irritation. Critical Study. Lewis 1969	/ Lewis 19	20											
			1												
			Chin Gudon			Chronic	Acute TRV	Chronic TRV	Acute			Acute	Chronic		
	Catance			Dermally absorbed	Acute Toxicity	Toxicity Value	Uncertainty	Uncertainty	TRV	i		Hazard	Hazard	Acute	Chronic
	Ē	\dagger	Area (m.)	dose (g/kg-day)	Value (g/kg)	(9/16)	Adjustment	Adjustment	(g/kg)	Chron	Chronic TRV (g/kg)	Quotlent	Quotlent	Effect	Effect
Summer Foraging Dermal Absorption	al Absorption		T											-	
	3000	0.0100	0.0260	1.0E-03	2	216	16	160	0.13	1	4E+00	8 OF-02	7 45-04 1	QV.	9
	4000	0.0050	0.0260	5.0E-04	2	216	16	160	0.13	-	1.4E+00	4.0E-02	3.7E-04 No		٩
	5000	0.0020	0.0260	2.0E-04	2	216	16	160	0.13	+	1.4E+00	1.6E-02	1.5E-04 No		9
,	8500		0.0260	1.0E-04	2	216	16	160	0.13	-	1.4E+00	8.0E-03	7.4E-05 P		9
	12000		0.0260	5.0E-05	2	216	16	160	0.13	-	1.4E+00	4 0E-03	3.7E-05		9
	24000		0.0260	2.0E-05	2	216	16	160	0.13	-	4E+00	1.6E-03	1.5E-05 No	T	2
	. 40000	0.0001	0.0260	1.0E-05	2	216	16	160	0.13	-	1.4E+00	8.0E-04	7.4E-06		9
														T	
Acute critical effect slig.	ht to moderate	*Acute critical effect slight to moderate skin irritation. Critical Study: Palmer 1990	dy: Palme	1990											
"Chronic critical effects	are well define	*Chronic critical effects are well defined erythema and edema. Critical Study: Lewis 1989	Critical Stu	ly: Lewis 1989											
			-												
						7							1]

Gray bat risk characterization for fog oil exposure under Pasquill Category C.

Acute TKV Chronic TKV Acute Chronic TKV Chronic		_										j				
Fig. Colored		Distance			Dally Chronic Intake	*Acute Toxicity	Toxicfty Value	Acute TRV	Chronic TRV	Acute	1,000	Chronic Dose	Acute	Chronic		
Fig. 2		Ē	Delly Acute Intal	ke Value (g/m²)	Value (g/kg-day)	Value (g/m²)	(g/m³)	Adjustment	Adjustment	(a/m ₂)	TRV (a/m³)	(a/kg-dav)	Quotient	Plezerd	Acute	Chronic
E-50 60																CHECK
Fig. 60 Column Fig. 160 3.75 6.3E-04 2.1E-07 2.7E-09 0.0E-09 No No No No No No No N	Maternity Cave Inhalatio	Ę														
Fig. 20 Fig. 375	Musgrave Hollow															
Fig. 60	Saltpeter #3	L		8	1 65.07			-			_					
Color Colo	Freeman			2	10000			2	160	3.75		2.1E-07	ı	7.5E-01 N		٧
Fig. 6 Fig. 6 Fig. 715 Fig. 6 Fig	Bally McCann Hollow				200			9	2	3.75		2.15-07	2.7E-05	0.0E+00 N		S.
Colored Colo	Saltbeter #3	L		S	S AE AE											
E-10	Freeman			3 2	3.00-00			16	. 160	3.75	i	2.1E-07		1.4E+01 N		Yes
E-06 E0 0.1 16 160 3.75 E.3E-04 2.1E-07 2.7E-05 0.0E-00 No No No No No No No	1000			5	0.05+00	99		9	160	3.75	6.3E-04	2.1E-07	L	N OCTEU O	Ī	94
Secondary Seco	Mush Paddie Hollow							`					L	3		2
E-00 60 0.1 16 160 3.75 6.3E-04 2.1E-07 2.7E-05 0.0E-00 No No No No No No No	Saltpeter #3			8	2.5E-06	9		46	160	3.75	A 35 04	2 48 07	247.00	10,		
E-00 60 0.1 16 160 3.75 6.3E-04 2.1E-07 2.7E-05 0.0E+00 No No No No No No No No	Freeman			5	0.0E+00	9		£	160	2.76	20.00	2.15-07	27.75	1.45+01 N		res
Fe-06 60 0.1 16 160 3.75 6.3E-04 2.1E-07 2.7E-05 0.0E+00 No No No No No No No	Ballard Hollow								201	3.73	0.3E-U4	2.1E-07	2./E-05	0.0E+00		٥
Feb. Color	Saltpeter #3			3	0.05	00										
Feed Acute Toxicity Toxicity Value (gi/kg) Adjustment Adjust	Freeman			1	00.100	B		9	160	3.75	6.3E-04	2.1E-07		0.0E+00 N		۶
Pee Moute Toxicity					20+00-0	8		16	160	3.75	6.3E-04	2.1E-07	2.7E-05	0.0E+00.N	Γ	9
Chronic Chronic Chronic TRV Acute Chronic TRV Acute Hazard Acute Chronic TRV Chronic TRV Chronic TRV Chronic TRV Chronic TRV Chronic TRV Chronic TRV Chronic TRV Chronic TRV Chronic TRV Chronic TRV Chronic TRV Chronic							_									
Fee of al. 1992 Partie P	Acute critical effect is of	pneumonia.	Critical Study: Shir	nn et al. 1987												
Chronic Acute TRV Chronic TRV Acute Acute Chronic TRV Acute Acute Chronic TRV Acute Chronic TRV Acute Chronic TRV Acute Chronic TRV Chroni	"Chronic critical effects	are minor lesio	ons of the heart, live	or and lungs. Crit		1997										
Page Page																
Ped Acute Toxicity Toxicity Value Toxicity Value Gifg) Gifg) Gifg Acute Toxicity Value Gifg Acute Toxicity Value Gifg Acute Toxicity Value Gifg Acute Toxicity Value Gifg Acute Toxicity Value Gifg Acute Toxicity Value Gifg Acute Toxicity Value Gifg Acute Toxicity Value Gifg Acute Toxicity Value			Dally Acust													
Name of State Acut		Distance	Intake Value		Promothy at a 1		Chronic	Acute TRV	Chronic TRV	Acute			Acute	Chronic	T	
Value (g/kg)		į	4-1-2		Detimany absorbed	Acute Toxicity	Toxicity Value	Uncertainty	Uncertainty	TRV			Hazard	Hazard	Acute	Chronic
E-04 2 216 16 160 0.13 1.4E+00 8.0E-03 7.4E-05 No No 1.6E-04 2.216 16 16 16 1.2E-05 No No No No No No No N			(B/m)	Area (m ⁻)	dose (g/kg-day)	Value (g/kg)	(g/kg)	Adjustment	Adjustment	(a/ka)	Chronic	TRV (a/kg)	Ountlant	o delto	E Hand	7
E-04 2 216 16 0.13 1.4E+00 8.0E-03 7.4E-05 No E-05 2 216 16 0.13 1.4E+00 8.0E-03 7.4E-05 No E-04 2 216 16 160 0.13 1.4E+00 8.0E-02 7.4E-05 No E-05 2 216 16 160 0.13 1.4E+00 8.0E-02 5.5E-04 No E-05 2 216 16 160 0.13 1.4E+00 1.6E-03 2.8E-05 No E-05 2 216 16 160 0.13 1.4E+00 1.6E-03 2.8E-06 No E-05 2 216 16 160 0.13 1.4E+00 1.6E-03 2.8E-06 No E-05 2 216 16 160 0.13 1.4E+00 4.0E-03 7.4E-06 No E-05 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	1													The line	130	Enect
E-04 2 216 16 160 0.13 1.4E+00 8.0E-03 7.4E-05 No E-04 2 216 16 160 0.13 1.4E+00 1.6E-03 1.5E-05 No E-04 2 216 16 160 0.13 1.4E+00 4.0E-02 5.5E-04 No E-05 2 216 16 160 0.13 1.4E+00 1.6E-03 2.8E-05 No E-05 2 216 16 160 0.13 1.4E+00 1.6E-03 3.2E-05 No E-05 2 216 16 160 0.13 1.4E+00 1.6E-03 3.2E-05 No E-05 2 216 16 160 0.13 1.4E+00 4.0E-03 7.4E-05 No E-05 2 216 16 160 0.13 1.4E+00 4.0E-03 1.8E-05 No E-05 2 216 16 160 0.13 1.4E+00 4.0E-03 1.8E-05 No E-05 2 216 16 160 0.13 1.4E+00 4.0E-03 1.8E-05 No E-05 2 216 16 160 0.13 1.4E+00 4.0E-03 1.8E-05 No E-05 2 216 16 160 0.13 1.4E+00 4.0E-03 1.8E-05 No E-05 2 216 16 160 0.13 1.4E+00 4.0E-03 1.8E-05 No E-05 2 216 16 160 0.13 1.4E+00 4.0E-03 1.8E-05 No E-05 2 216 16 160 0.13 1.4E+00 4.0E-03 1.8E-05 No E-05 2 216 16 160 0.13 1.4E+00 4.0E-03 1.8E-05 No E-05 2 216 16 160 0.13 1.4E+00 4.0E-03 1.8E-05 No E-05 2 216 16 160 0.13 1.4E+00 4.0E-03 1.8E-05 No E-05 2 216 16 160 0.13 1.4E+00 4.0E-03 1.8E-05 No E-05 2 216	daternity Cave Dermal A	psorption											1			
E-04 2 216 16 160 0.13 1.4E+00 8.0E-03 7.4E-05 No No E-05 2 216 16 160 0.13 1.4E+00 8.0E-03 7.4E-05 No No E-04 2 216 16 160 0.13 1.4E+00 8.0E-02 5.5E-04 No No E-05 2 216 16 160 0.13 1.4E+00 8.0E-02 4.6E-04 No No E-05 2 216 16 160 0.13 1.4E+00 1.6E-03 2.8E-06 No No E-05 2 216 16 160 0.13 1.4E+00 1.6E-03 1.8E-05 No No E-05 2 216 16 160 0.13 1.4E+00 4.0E-03 1.8E-05 No No E-05 2 216 16 160 0.13 1.4E+00 4.0E-03 1.8E-05 No No	Musgrave Hollow															
F-05	Saltpeter #3	5447		0.0260	1 05 04	•	4,0	7			1					
E-04 2 210 16 0.13 1.4E+00 1.6E-03 1.5E-04 No E-04 2 2.16 16 160 0.13 1.4E+00 8.0E-02 5.5E-04 No E-04 2 2.16 16 160 0.13 1.4E+00 8.0E-02 5.5E-04 No E-05 2 2.16 16 160 0.13 1.4E+00 8.0E-02 4.6E-04 No E-05 2 2.16 16 160 0.13 1.4E+00 1.6E-03 9.2E-06 No E-05 2 2.16 16 160 0.13 1.4E+00 4.0E-03 7.4E-06 No E-05 2 2.16 16 160 0.13 1.4E+00 4.0E-03 7.4E-06 No	Freeman	13104		0 0260	2 05 05	7	917	2	160	0.13	+	4E+00	8.0E-03	7.4E-05 N		Ş
E-04 2 216 16 160 0.13 1.4E+00 8.0E-02 5.5E-04 No E-04 2 2.16 16 160 0.13 1.4E+00 4.0E-03 2.8E-05 No E-04 2 2.16 16 160 0.13 1.4E+00 8.0E-02 4.6E-04 No E-05 2 2.16 16 160 0.13 1.4E+00 1.6E-03 7.4E-06 No E-05 2 2.16 16 160 0.13 1.4E+00 4.0E-03 1.8E-05 No E-05 2 2.16 16 160 0.13 1.4E+00 4.0E-03 1.8E-05 No	Bally McCann Hollow		!			,	217	91	160	0.13	-	€ E+00	1.6E-03	1.5E-05 N		9
Color Colo	Saltneter #3	2004		09000	19.5											
E-04 2 216 16 160 0.13 1.4E+00 4.0E-03 2.8E-05 No E-05 2 216 16 160 0.13 1.4E+00 1.6E-03 No E-05 No E-05 2 216 16 160 0.13 1.4E+00 1.6E-03 No E-05 No E-05 2 216 16 160 0.13 1.4E+00 1.6E-03 No E-05 No E-05 2 216 16 160 0.13 1.4E+00 1.6E-03 1.8E-05 No E-05	Freeman	12021		0070	1.05-04	7	216	16	160	0.13	-	4E+00	8.0E-02	5.5E-04 N		9
E-04 2 216 16 160 0.13 1.4E+00 8.0E-02 4.6E-04 No E-05 2 2.16 16 160 0.13 1.4E+00 1.6E-03 3.2E-06 No E-05 2 2.16 16 160 0.13 1.4E+00 4.0E-03 7.4E-06 No E-05 2 2.16 16 160 0.13 1.4E+00 4.0E-03 1.8E-05 No	Atteh Paddle Hollow	*7071	0.0000	0.0200	3.7E-05	2	216	16	160	0.13	-	4E+00	4.0E-03	2.8E-05 N	I	2
E-04 2 216 16 0.13 1.4E+00 8.0E-02 4.6E-04 No No No No No No No N	Ch redeert Ch	,76,									-					
E-05 2 216 16 160 0.13 1.4E+00 1.6E-03 9.2E-06 No E-05 2 216 16 160 0.13 1.4E+00 1.6E-03 7.4E-06 No E-05 2 216 16 160 0.13 1.4E+00 4.0E-03 1.8E-05 No E-05 2 216 16 160 0.13 1.4E+00 4.0E-03 1.8E-05 No E-05 2 2 2 2 2 2 2 2 2	2	0.30	3	0.0260	6.2E-04	2	216	16	160	0.13		4F+00	R OF O	4 6E 04 N	I	
E-05 2 216 16 160 0.13 1.4E+00 1.0E-03 9.2E-06 No E-05 2 216 16 160 0.13 1.4E+00 1.0E-03 1.8E-05 No	Freeman	16542	0.0002	0.0260	1.2E-05	2	216	¥	685	5			מים ביים	10-00 I	1	9
E-05 2 216 16 160 0.13 1.4E+00 1.6E-03 7.4E-06 No E-05 2 216 16 160 0.13 1.4E+00 4.0E-03 1.8E-05 No E-	Sallard Hollow							2	201	2	-	45+00	1.6E-03	9.2E-08 N		0
E-05 2 216 16 0.13 1.4E+00 1.6E-03 7.4E-06 No	Saltpeter #3	13821	0.0002	0.0260	1.0E-05	6	216	46	100	1	- · 					
1.4E+00 4.0E-03 1.8E-05 No	Freman	11266		0.0260	20 55 06	-	2 3	2 !	2	0.13	-	£+00	1.6E-03	7.4E-06 N		ė
*Chronic critical effects sight to moderate skin inflation. Critical Study: Palmer 1990 **Chronic critical effects are well defined enythema and edema. Critical Study: Lewis 1989				2000	Z. 3E-03	7	216	16	160	0.13	+	4E+00	4.0E-03	1.8E-05 N		٥
*Chronic critical effects are well defined erythems and edema. Critical Study: Levis 1989	Acute critical effect slich	it to moderate	skin irritation Critic	Study Dalma	4000										-	
Transport of the state of the s	"Chronic critical effects a	ire well define	d enthema and ede	and Cody. railing	dir. 1930										<u> </u>	
			200	CIIIKAI GIO	Cy. Lawis 1309									-		
								_					T		t	T

Gray bat risk characterization for fog oil exposure under Pasquill Category D.

Mobile Smoke															
	Distance			Daily Chronic Intake	*Acute Texicity	Toxicity Value	Uncertainty	Uncertainty	TRV	Chronic	Adjusted TRV	Hazard	Mazard	Acute	Chronic
	Œ	Dally Agute Intake Value (g/m³)	_	Value (g/kg-day)	Value (g/m³)	(g/m²)	Adjustment	Adjustment	(0/m³)	TRV (g/m³)	(g/kg-day)	Quotient	Quotient	Effect	Effect
Summer Foraging Inhalation	ation														
	2500	0.0100	Q	1.3E-06	09	0.1	91	160	3.75		2.1E-07				Yes
	3000		Q	6.7E-07	09	1.0		160	3.75	6.3E-04	2.1E-07				Yes
	4500	0.0020	Q.	2.7E-07	09	0.1		160	3.75		2.1E-07	5.3E-04	1.3E+00 No		Yes
	0009	0.0010	0	1.3E-07	9	0.1		160	3.75		2.15-07				9
	9500	0.0005	15	6.7E-08	8	0.1	91	160	3.75		2.1E-07				<u>ې</u>
	16500	0.0002	12	2.7E-08	9	0		160	3.75	6.3E-04	2.1E-07	5.3E-05			۶
	26500		7	1.3E-08	99	0.1		160	3.75	6.3E-04	2.1E-07				٩
"Acute critical effect is oil pneumonia. Critical Study: Shinn et al. 1987	il pneumonia.	Critical Study: Shin	n et al. 1987												
"Chronic critical effects are minor lesions of the heart, liver and lungs. Critical Study: Oriver et	are minor lesion	ons of the heart, live	r and lungs. Crh		al. 1992										
				Softe Of the Late to	100	Chronic	Acute TRV	Chronic TRV	Acute			Acute	Chronic	Active	Chronic
	Distance		_	Value (cite day	Acute toxicity	loxicity value	Oncertainty	Officertainty	V (0)	Jacob	Chronic TDV (alka)	Cicilent	O totlent	T T	Fffert
	(m)	Daily Acute intake Value (g/kg)	e value (g/kg)	value (g/kg-day)	Value (givg)	(AuA)	manus north	The street of th	(Aug)		(Rush) Aut A				
Summer Foraging Ingestion	tion														
	6500	0.0100	Q,	9.3E-07	17.6	22	16	1600	1.10		1.4E-02	9.1E-03			ş
	8500	0.0050	٥٥	4.7E-07	17.6	22		1600	1.10		1.4E-02	4.5E-03			No
	14500		Q	1.9E-07	17.6			1600	1.10		1.4E-02	1.8E-03			9
	22000	0.0010	٥	9.3E-08	17.6		91	1600	1.10		4E-02	9.1E-04			No
	35500	0.0005	55	4.7E-08	17.6	22		1600	1,10		1.4E-02	4.5E-04	3.4E-06 No		S.
	\$0000÷	0.0002	72	1.9E-08	17.6		91	1600	1.10		1.4E-02	1.8E-04			2
	++0000G	0.0001	16	9.3E-09	17.6	22		1600	4.		1.4E-02	9.1E-05	6.8E-07	ę.	S S
*Acute critical effects are weight loss and lesions of the liver, spleen, and kidney. Critical Study	e weight loss a	nd lesions of the live	er, spleen, and k	idney. Critical Study:	Bramacharl 1958										
"Chronic critical effect is gastrointestinal irritation. Critical Study: Lewis 1989	s gastrointestin	al irritation. Critical	Study: Lewis 1	989											
		Dairy Acute				Chronic	Acute TRV	Chronic 1RV	Acute	_		Yenre	Chronic	4	1
	Distance	Intake Value	Aria (mg	Dermally absorbed	Acute toxicity	enies Asine	Oncertainty	Uncertainty	/A/kg	Jacan	Chronic TRV (alka)	Disting	Ouotlent	E Cons	Effect
	ì			(Augusta)	(Rush)	(Rush))Au						
Summer Foraging Dermal Absorption	al Absorption														
	6500	0.0100	0.0260	1.0E-03				160			1.4E+00	8.0E-02	7.4E-04 No		ş
	8500	0.0050	0.0260	5.0E-04		216	15	160			1.4E+00	4.0E-02			٩
	14500	0.0020	0.0260	2.0E-04				160			1.4E+00	1.6E-02			ş
	22000		0.0260	1.0E-04	2			160			.4E+00	8.0E-03			No
	35500	0.0005	0.0260	5.05-05				160			4E+00	4.0E-03			No.
	\$0000÷			2.0E-05	2	216		160	0.13		1.4E+00	1.6E-03	1.5E-05 No		ş
	-50000++			1.0E-05	2	216	16	160			.4E+00	8.0E-04			ş
*Acute critical effect slight to moderate skin irritation. Critical Study: Palmer 1990	ht to moderate	skin irritation. Critic	cal Study: Palme	r 1990											
"Chronic critical effects are well defined erythema and edema. Critical Study: Lewis 1989	are well define	ed enythema and ed	ema, Critical Stu	udy: Lewis 1989											

Gray bat risk characterization for fog oil exposure under Pasquill Category D.

						Chronic	Acute TRV	Chronic TRV	ACUTE		Chronic Dose	Acute	Chronic		
	(m)	Daily Acute Intake Value (g/m³)		Daily Chronic Intake Value (g/kg-day)	*Acute Toxisity Value (g/m²)	Toxicity Value (g/m³)	Uncertainty	Uncertainty	TRV (a/m³	Chronic TRV (a/m³)	Adjusted TRV (o/kg-dav)	Hazard	Hazard	Acute	Chronic
															CIIACI
Maternity Cave Inhalation	_														
Musgrave Hollow															
Saltpeter #3		0.0010	0	1.15-10		0.1	16	160	3.75	8 3E-04	20 45 07	1		Ī	
Freeman	13104	0.0002	12	0.0E+00	9	50		200	2 75	0.00	2.15-0/	2007.7			0
Bally McCann Hollow						5		3	9,79	0.35-04	Z.1E-U/		0.0E+00 No		2
Saltpeter #3	2004	0.0100	٥	1.0E-09	9	-	4	031	27.0	0.00	2000				
Freeman			2	00+100		3		200	2/0	6.3E-04	2.1E-07	2.7E-03			No
Mush Paddie Hollow				0.0		2.0	91	160	3.75	6.3E-04	2.1E-07	5.3E-05	0.0E+00 No		S
Saltpeter #3	1751	0.0100	٥	8 4F-10			9	007	1	1,010					
Freeman	16542		22	00+00	8 6		0 9	001	5,73	6.3E-04	2.1E-07				S.
Ballard Hollow				20.00			2	091	3.73	6.3E-04	2.1E-07	5.3E-05	0.0E+00 No		ş
Saltpeter #3	13821	0.0002	2	0.0E+00	99	0.1	16	160	7 7	6 35 04	70 21 6		00.100		-
Freeman	11266	0.0002	12	0.0E+00	8	2	46	460	3 75	20 25 9	2.15-07	00-00-0	1	Ī	2
							2	201	9.73	0.3E-U4	2.1E-U/		0.0E+00 No		92
*Acute critical effect is oil pneumonia. Critical Study: Shinn et al. 1987	pneumonia.	Critical Study: Shini	n et al. 1987						1	1					
"Chronic critical effects are minor lesions of the heart. Iver and lungs. Critical Study. Driver at	are minor lesio	ns of the heart liver	and lunds Crit		1 1002					+					
					-					+					
		AND ACTIVE											_	_	
	Distance		Skin Surface	Dermally absorbed	*Acute Toxicity	Toxicity Value	Acute TRV	Chronic TRV	Acute			Acute	Chronic		
	Ê	(g/m²)	Area (m²)	dose (g/kg-day)	Value (a/ko)	(a/ka)	Adlustment	Adiretment) (alkg	ola ca d'	Total TOY (alter)	Hazard	Hazard	Acute	Chronic
						faat	111111111111111111111111111111111111111	Mallianday	S S		INV (g/kg)	Cuotient	Cuotient	1960	EHect
Maternity Cave Dermal Absorption	bsorption								1						
Musgrave Hollow									†						
Saltpeter #3	5447	0.0100	0.0260	1.0E-03		216	46	196	5		45.00	100	1,0		
Freeman	13104	0.0020	0.0260	2.0E-04	2	216	5 5	9	2 5		.4E+00	8.0E-02	7.4E-04 NO		02
Bally McCann Hollow							2	20	2	+	200	1.05-02	1.3E-04 NO		2
Saltpeter #3	2004	0.0100	0.0260	7.5E-04	2	216	16	160	0 13	-	1 45+00	A OF AS	A SE OF	T	
Freeman	12024	0.0020	0.0260	1.5E-04	2	216	19	160	0 13	-	4F±00	4 6E 02			2
Mush Paddle Hollow										+	2	1.05-02	1.10-04		e
Saltpeter #3	1751	0.0100	0.0260	6.2E-04		216	9	160	0 13		4F±00	0 30 a	A SE 04 A		
Freeman	16542	0.0010	0.0260	6.2E-05	2	216	4	9	2 5	-	20.00	9.00-02	N 40-00 4		02
Ballard Hollow							2	3	2	+	200	8.UE-03	4.6E-05 No		Q.
Saltpeter #3	13821	0.0020	0.0260	1.0E-04	2	216	16	160	0 13		1 45400	1 65 00	7 45 06 11		
Freeman	11266	0.0020	0.0260	1 0E-04		316	9	5		•	200	1.00-02	ON CO-34.	Ī	Q.
					1	017	2	201	0.13	-	1.4E+00	1.6E-02	7.4E-05 No		S.
*Acute critical effect slight to moderate skin kritation Critical Study: Datmer 1000	t to moderate	aich Irritation Critica	al Study: Datmer	1000											
*Chron's riting affacts are well defined enthems and adams. Others Reserve	re well define	4 enthema and ede	ma Chian Phin	1990 this 1 courts 4000											
CITCHING CHANGE CO.	מבווונה	מו אוופווופ פוות בחב	Sitte. Offices our	dy. Lewis 1909					-				_		
Å														r	

Gray bat risk characterization for fog oil exposure under Pasquill Category E.

						THOUSE THE	Acute TRV	Chronic TRV	ACUTE		Chronic Dose	Acute	Chronic		
			•	-	-	-									
	Distance	Cally Acute Indaka Value (m ^m)		Dally Chronic Intake	*Acute Toxicity	Toxicity Value	Uncertainty	Uncertainty	TRV [a/m²]	Chronic TRV (g/m³)	Adjusted TRV (g/kg-day)	Hazard	Hazard	Acute	Chronic Effect
	(III)	Dally Acute Illian	,	(Amana) anima					1						
Summer Forsoing Inhalation	ģ														
	3000	0.0100	٥	1.3E-06	99	0.1	91	160	3.75	6.3E-04	2.1E-07		8.4E+00 No	ş	Y 85
	4000	0.0050		6.7E-07	9	0.1		160	3.75	6.3E-04	2.1E-07		3.2E+00 No	2	20
	0002	0.000	0	2.7E-07	8	0.1		160	3.75	6.3E-04	2.1E-07		1.3E+00 No	ş	Yes
	200	00000		1 3E-07	9	0.1		160	3.75	6.3E-04	2.1E-07		6.4E-01	No	S S
	2000		2	8 7E 08	9	-		160	3.75	6.3E-04	2.1E-07		3.2E-01	S.	ş
	0000		2,	2 75 08	3 8	50		160	3.75	6.3E-04	2.1E-07		1.3E-01 No	ş	ટ
	nons		7,	4.7E-00	3 8	5		460	3.75	6.3F.04	2 1E-07	l	6.4E-02	ş	ş
	20000	0.0001		1.35-08	8	5		2	2	50.0	10.00				
Calculation of the Control of the Co		Order Chicken	7001 1047												
Acute crucal enect is on	Directionia	Clifical Globy. Gilli	1001	Mont Study: Driver of of	4000										
*Chronic critical effects are minor lesions of the heart, liver and lungs. Critical Study. Liver of	are minor lesk	ons of the heart, live	r and lungs. Cr	tical Study. Diver et a	1.1994										
						Chronic	Acute TRV	Chronic TRV	Acute			Acute	Chronic		
	- Contain	_		Dally Chronic Intake	*Acute Toxicity	Toxicity Value	Uncertainty	Uncertainty	TRV			Hazard	Hazard	Acute	Chronic
	(m)	Dally Acute (ptake Value (g/kg)		Value (d/kg-day)	Value (o/kg)	(a/ka)	Adjustment	Adjustment	(g/kg)	Chronic	Chronic TRV (g/kg)	Quotient	Quotient	Effect	Effect
Super Formula Indestina	ģ														
A Service Continue	7500	0.0100	9	9.3E-07	17.6		16	1600	1.10	-	1.4E-02	9.15-03	6.8E-06	S.	2
	10000		9	4.7E-07	17.6			1600	1,10		1.4E-02	4.5E-03	3.4E-05 No	ş	ş
	18000		P	1.9E-07	17.6	22	16	1600	1.10	-	1.4E-02	1.8E-03	1.4E-05	S	٤
	00000		0	9.3E-08	17.6	22		1600	1.10	-	.4E-02	9.1E-04	6.8E-06 No	S.	2
	50000		يو	4.7E-08	17.6	22		1600	1.10	-	1.4E-02	4.5E-04	3.4E-06	2	No.
	50000+		2	1.95-08	17.6	22		1600	1.10	•	1.4E-02	1.8E-04	1.4E-06 No	윈	ş
	\$0000 **	0 0001	-	9.3E-09	17.6	22	16	1600	1.10	1	1.4E-02	9.1E-05	6.8E-07 No	2	S S
-Anite critical effects are weight loss and lesions of the liver, spleen, and kidney. Critical Study	weight loss ar	nd lesions of the live	er, spleen, and k	┪.、	Bramacharl 1958										
**Chronic critical effect is gastrointestinal irritation. Critical Study: Lewis 1989	gastrointestin	al irritation. Critical	Study: Lewis 1												
		Daily Acute				"Chronic	Acute TRV	Chronic TRV	Acute			Acute	Chronic	-	1
	Distance	Intake Value	Skin Surface	Dermally absorbed	*Acute Toxicity	Toxicity Value	Uncertainty	Uncertainty	TRV	i		Hazard	Hazard	אבחופ	
	(E)	(g/m²)	Area (m²)	dose (g/kg-day)	Value (g/kg)	(g/kg)	Adjustment	Adjustment	(g/kg)	S	Chronic TRV (g/kg)	Quotient	Quotient	ETIECT	EHECT
Summer Foraging Dermal Absorption	al Absorption							000	4250	1	45400	8 05-02	7 4F-04 No	No.	S.
	7500		0.0250	1.05-03	7						2010	4 05 03		S	2
	10000		0.0260	5.0E-04	2	917		095	0.1250		145400	1 SE-02		2 2	2
	18000		0.0260				9		1		1.45700	20.00		2 2	2 2
	30000		0.0260								W-24	0.00-03	1	2 2	2 4
	20000	90000	0.0260	5.0E-05				091	┙		1.45-00	4.0E-U3		2 2	2 2
	20000+		0.0260	2.0E-05				160			1.45+00	1.6E-03		2 :	2
	++0000S	0.0001	0.0260	1.0E-05			16	160	0.1250		1.4E+00	8.0E-04	7.4E-06	٤	2
*Acute critical effect is slight to moderate skin irritation. Critical Study: Palmer 1990	ight to modera	ite skin irritation. Cr	ritical Study: Pa.	Imer 1990											ļ
**Chronic critical effects are well defined enythema and edema. Critical Study. Lewis 1989	are well define	d enotherna and ed	lema. Critical St.	udy: Lewis 1989											
Ollicin vincer												L			

Gray bat risk characterization for fog oil exposure under Pasquill Category E.

	i					Chronic	Acute TRV	Chronic TRV	ACING					į	
	(m)	Dally Acute Intake Value (g/m³)	ike Value (g/m³)	Daily Chronic Intake Value (g/kg-day)	*Acute Toxicity Value (a/m³)	Toxicity Value	Uncertainty	Uncertainty	TRV.	Chronle	Adjusted TRV	Acute Hazard	Chronic	Acute	Chronic
							The market	Adjustment	(a/m²)	TRV (g/m²)	(g/kg-day)	Quotlent	Quotient	Effect	Effect
Maternity Cave inhaiation	5														
Musgrave Hollow															
Saltpeter #3	3 5447	0.0020	020	2 4E-40											
Freeman	13104	0 0005	205	0000	8		9	160	3.75	6.3E-04	2.1E-07	5.3E-04	1 0F-03 No		No.
Bally McCann Hollow				0.00		0.1	16	160	3.75	6.3E-04	2.1E-07	1.3E-04	ON OF TOO NO		2 2
Saltpeter #3	L	0.0100	00	00 30 0											2
Freeman	12024		50	80-U0-0	8		16	. 160	3.75	6.3E-04	2.1E-07	2.7E-03	A RE-DR		1
Mush Paddle Hollow				0.05+00	8	0	16	160	3.75	6.3E-04	2 1E-07	1 3E.04	O DE TOU		
Saltpeter #3	1751	00100	8	A 51 0								1	20100		9
Freeman	-16542		95	0.4E-10	9 8	0.	16	160	3.75	6.3E-04	2.1E-07	2.7E-03	4.0E-03 No		2
Ballard Hollow				200	90	0.1	92	160	3.75	6.3E-04	2.1E-07	1.35-04	0.0E+00 No		2
Saltpeter #3	13821	0.0005	8	00.00											
Freeman	11266		95	OCETOO	2 8		9	160	3.75	6.3E-04	2.1E-07	1.36-04	0 0F+00 N		2
				20.0	8	0.1	16	160	3.75	6.3E-04	2.1E-07	1.3E-04	OOF+OO No	T	2 2
*Acute critical effect is oil poelimonia Critical Children	phelimonia	Orithma Chudur Chi											2.02.100		2
"Chronic critical effects	are minor legio	Cilical Study. Shi	nn et al. 1987												
or of the state of the state of the near, INPT and lungs. Cratical Study: Driver et	0.601 10.011	ns or the near, IN	or and lungs. Cri		al. 1992				T						
	-	Daily Acute				"Chronic	Acute TOV	Thronia Total						:	
	Distance	Intake Value	Skin Surface	Dermaily absorbed	*Acute Toxicity	Toxicity Value	Uncertainty	Uncertainty	TRV T		<u> </u>	Acute	_		
	(E)	(a/m²)	Area (m*)	dose (g/kg-day)	Value (g/kg)	(g/kg)	Adjustment	Adjustment	(a/ka)	Chronic	Chronic TRV (a/ka)	District C	_	Acute	Chronic
Maternity Cave Dermai Absorption	heorotion									-			Guorient	E II OCI	ETTOCI
Wiedraw Hollow	TO TO TO													1	
HOHO! OARING															
Sartpeter #3	5447	0.0100	0.026	1.0E-03	2	216	100								
Freeman	13104	0.0020	0.026	2 DF-04	-	2 3	2	202	0.1250	-	1.4E+00	8.0E-02	7.4E-04 No		No
Bally McCann Hollow					1	919	٥	160	0.1250		1.4E+00	1.6E-02	1.5E-04 No		No
Saltpeter #3	2004	0.0100	0.026	7.5E-04	·	0,0									
Freeman	12024	0.0020	0.026	1 55.04	1	212	9	160	0 1250	1.4	1.4E+0C	8.0E-02	5.5E-04 No		SZ.
Mush Paddle Hollow				10.30	7	216	16	160	0.1250	1,1	1.4E+00	1.6E-02	1 1F-04 No		
Saltpeter #3	1751	00100	3000	0.00											
Freeman	16542	0,000	9000	0.2E-04	2	216	16	160	0.1250	2	.4E+00	S OF O	A GE OF NO	Ī	
Ballard Hollow			0.020	1.2E-U4	2	216	16	160	0.1250	4.1	1.4E+00	165.02	O ZE OK NO	T	0
Saltpeter #3	13821	0.0020	9000	10 E 0 1	•								0.55		
Freeman	11266	0 0000	0.026	1000	2	216	16	160	0.1250	1.4	1.4E+00	4 6E.02	7 45 05 110	Ī	
		2	0.020	1.05-04	2	216	16	160	0.1250	1.4	4E+00	1 65 02	7 4E OF 14		2
*Acute critical effect is slight to moderate skip irritation Critical Studies Co.	oht to moderat	e skin irritation	Signal Charden	0007								1.05-02	ON CO-38''		
"Chronic critical effects are well defined enghema and adam. Care of	re well define	andhema and ad	ilical Study. Pair	Dec 1990								+			
		מו מווח פח	ciria. Craccai SC	dy: Lewis 1989					T	-					
,						-			\mid	+	1	1		1	
										_		-			

Attachment G: Terephthalic Acid (TPA) Grenades

Gray bat risk characterization for TPA exposure under Pasquill Category B.

				-		-	,				***************************************				
TPA Smoke Grenade														-	
	7			Total of the Paris of the Paris of Table T	aviolar	Toyleiby Value	Acute TRV	Chronic TRV	Acute	Chronic	Chronic Dose	Acute	Chronic	Acut.	2 40
-	(m)	Daily Acute Intake Value (g/m³)		Value (g/kg-day)	g/m³)	(m/b)	Adjustment	Adjustment	_	TRV (g/m³)	(B/kg-day)	Quotient	Quotient	Effect	Effect
Summer Foraging Inhalation	ation														
	3000			1.3E-03	8.6	8.6	-	30	8.6E+00	2.9E-01	9.7E-05		1.3E+01	Yes	Yes
	4000	5.0E-03		7.0E-07	8.6	8.6	-	90	8.6E+00	2.9E-01	9.7E-05	5.8E-04	7.2E-03	S	S.
	4000			2.8E-07	8.6	8.6	-	30	8.6E+00	2.9E-01	9.7E-05		2.9E-03	No	No
	4000	1.0E-03		1.4E-07	8.6	9.8	-	30	8.6E+00	2.9E-01	9.7E-05			٥	No
	2000	5.0E-04		1.0E-08	8.6	8.6	-	30	8.6E+00	2.9E-01	9.7E-05	5.8E-05		No	No
	2000	2.0E-04		2.8E-08	8.6	8.6	1	30	8.6E+00	2.9E-01	9.7E-05			٥	No
	0009	1.0E-04		1.4E-08	8.6	8.6		30	8.GE+00	2.9E-01	9.7E-05	1.2E-05	1.4E-04	S	Š
*Acute critical effects are necrosis and inflamation of the nasal cavity. Critical Study: Muse et al. 1995	e necrosis and	inflamation of the nasal	cavity. Critic.	al Study: Muse et al. 19.	95										
**Chronic critical effects are edema of lungs and emphysema. Critical Study. Muse et al. 1995	are edema of	lungs and emphysema.	Critical Stud	y: Muse et al. 1995											
						"Chronic	Acute TRV	Chronic TRV	Acute		Chronic Dose	Acute	Chronic		
	Distance			Daily Chronic Intake "Acute"	*Acute Toxicity	Toxicity Value	Uncertainty	Uncertainty	TRV.	Chronic	Adjusted TRV	Hazard	Hazard	Acute	Chronic
	(m)	Daily Acute Intake Value (g/m3)	(alue (g/m³)	Value (g/kg-day)	Value (g/m³)	(g/m³)	Adjustment	Adjustment	(g/m³)	TRV (g/m³)	(g/kg-day)	Quotient	Quotient	Effect	Effect
Maternity Cave Inhalation	ç														
	3000	00+30'6		2.5E-03	8.6		-	30	8.6E+00	2.9E-01	9.7E-05		2.6E+01	Yes	Yes
	4000	5.0E-03		1.4E-06	8.6	8.6	•	30	8.6E+00		9.7E-05		1.4E-02	Š	ş
	4000	2.0E-03		2.6E-07	8.6		1	30	8.6E+00	2.9E-01	9.7E-05	2.3E-04		운	Š
	4000	1.0E-03		2.8E-07	8.6		•	30			9.7E-05			S	Š
	2000			1.4E-07		8.6	1	30			9.7E-05			ટ	Š
	2000	2.0E-04		90-39'S			•	30			9.7E-05			2	Š
	0009	1.0E-04		2.8E-08		9.8	-	30	00+39'8	2.9E-01	9.7E-05	1.2E-05	2.9E-04	2	2
*Acute critical effects are necrosis and inflamation of the nasal cavity. Critical Study. Muse et al. 1995	e necrosis and	inflamation of the nasal	l cavity. Critic	al Study. Muse et al. 19	395										
**Chronic critical effects are edema of lungs and emphysema. Critical Study: Muse et al. 1995	are edema of	lungs and emphysema.	Critical Stud	fy: Muse et al. 1995											

Attachment G: TPA Smoke Pots

Gray bat risk characterization for TPA exposure under Pasquill Category B.

IPA Smoke Pots			_											-	
						STATE OF THE	1120	() () () () ()							
	Distance			Daily Chronic Intake "Acute	-	Toxicity Value	Acute 1KV Uncertainty	Chronic IXV Uncertainty	Acute	Chronic	Chronic Dose Adjusted TRV	Acute	Chronic	Acute	Chronic
	ε	Daily Acute Intake Value (g/m³)	ue (g/m²)	Value (g/kg-day)	Value (g/m³)	(g/m³)	Adjustment	Adjustment	(g/m³)	TRV (g/m³)	(g/kg-day)	Quotient	Quotient	Effect	Effect
													ŀ	l	Ī
Summer Foraging Inhalation	ation													1	
	3000			3.8E-04	8.6	9.8	-	30	8 6F+00	2 QE-01	975.05	4 05+00	3 05.00	>	,
	4000	5.0E-03		2.1E-07	8.6		-	30	1	2 05-01	0.75.05		201700	8 3	£ .
	2000	2.0E-03		8.5F-08	A B		-	300	ı		9.75-05	Ì	ı	2	2
	2000			A 2E-DB			1	06	0.01100		S./E-U2	7.3E-04	8.8E-04	ž	2
	2000			20 74.0	0.0			3	- 1	İ	9.7E-05	ļ		ž	ž
	0000			7.1E-08	9.6		-	30	J	2.9E-01	9.7E-05			운	ş
	0000			8.5E-09	8.6		=	8	8.6E+00	2.9E-01	9.7E-05			2	2
	200/	1.0E-04		4.2E-09	8.6	8.6	1	30	8.6E+00	2.9E-01	9.7E-05			2	2
*Acute critical effects are	s necrosis and I	*Acute critical effects are necrosis and inflamation of the nasal cavity. Critical Study. Muse et al. 1995	avity. Critic	al Study: Muse et al. 19	95										
"*Chronic critical effects	are edema of 1	**Chronic critical effects are edema of lunds and emphysems - Critical Study Muse of all 1005	Princel Chief	White of all 1005											
		and company and in	The second	y. Muse et al. 1990											
									_						
						"Chronic	Acute TRV	Chronic TRV	Acute		Chronic Dose	Actiba	Shronin	1	T
	Distance			Daily Chronic Intake Acute		Toxicity Value	Uncertainty	Uncertainty	TRV	Chronic	Adjusted TDV	Pactor	Larrard		.,
	(m)	Daily Acute Intake Value (g/m³)	$\overline{}$	Value (g/kg-day)	Value (g/m³)		Adjustment	Adjustment	(a/m ₂)	TRV (a/m³)	(a/ka-dav)	Ouotlent	Onotient	Fiffert	Frence
											111111111111111111111111111111111111111				
Maternity Cave Inhalation	_													†	T
	3000	9.0E+00		7.6E-04	8.6	8.6	-	30	8.6E+00	2 9F-01	9 75-05	1 0F+00	7 95+00	Vac	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
	4000			4.2E-07	8.6	8.6	-	30	1	2.9F-01	9.7F-05		4 4F-03	2 2	S V
	2000			1.7E-07	8.6		-	30	1	2.9E-01	9.7E-05		1 RF-03	2 2	2 2
	2000			8.5E-08	9.8	8.6	-	30	1	ĺ	9.7E-05		8 8F-04	2	2
	2000	5.0E-04		4.2E-08	8.6	8.6	-	30	8.6E+00	2 9F-01	9.75-05	5 AE.05	A AF DA	2 2	2 2
	0009	2		1.7E-08	8.6	8.6	-	30	1.		9.7E.05		1,150	2 2	2 2
	7000	1.0E-04		8.5E-09	8.6		-	30		2.9E-01	9.7E-05		2 A A C - C - C - C - C - C - C - C - C -	2 2	2 2
													2000		2
*Acute critical effects are	necrosis and i	*Acute critical effects are necrosis and inflamation of the nasal cavity. Critical Study: Muse et al. 1995	avity. Critic	al Study: Muse et al. 19	95										
**Chronic critical effects	are edema of It	**Chronic critical effects are edema of lungs and emphysema. Critical Study: Muse et al. 1995	Pritical Stud	y: Muse et al. 1995											
					A					1		_	_		_

Attachment G: Titanium Dioxide Grenades

Gray bat risk characterization for titanium dioxide exposure under Pasquill Category E.

	Distance	Daily Acute Intake Value Daily Chronic Intake "Acute Tox	Daily Chronic Intake	*Acute Toxicity	**Chronic Toxicity Value	Acute TRV Uncertainty	Chronic TRV Uncertainty	Acute TRV	Chronic	Chronic Dose Adjusted TRV	Acute Hazard	Chronic Hazard	Acute	Chronic
	(m)		(Aun-fa/fa) anun	value (g/m /	(Burn)	Manusch	William Co.		I III ANI	(Avan-ava)	Muonent	Gaoriani	רוופנו	
Summer Foraging Inhalation	lion							-					1	
		1	2.1E-08	0.25	0.25	-	160	2.5E-01	1.6E-03	5 3E-07	4.0E-02	4.1E-02	2	S
	300		1.1E-08	0.25	0.25		160	2.5E-01	1.6E-03	5.3E-07	2.0E-02	2.0E-02	ટ	2
	200		4.3E-09	0.25	0.25		160	2.5E-01	1.6E-03	5.35-07	8.0E-03	8.1E-03	2	2
	700	1.0E-03	2.1E-09	0.25	0.25		160	2.5E-01	1.6E-03	5.3E-07	4.0E-03	4.1E-03	ટ	Š
	1000		1.1E-09	0.25	0.25	-	160	2.5E-01	1.6E-03	5.35-07	2.0E-03	2.0E-03	S	2
	1400		4.3E-10	0.25	0.25	-	i	2.5E-01	1.6E-03	5.3E-07	8.0E-04	8.1E-04	S	2
	1800	1.0E-04	2.1E-10	0.25	0.25		160	2.5E-01	1.6E-03	5.3E-07	4.0E-04	4.1E-04	£	Š
• And the state of the And	of forms	Manda basishi sadas asamada anna la tanada akanasa 1000 atau akanasa da sadasa sa sadasa sadasa sadasa sadasa 4000	A cuto critical officers		Joseph Children	1000	1	1						
Acute toxicity value ass	ninea edual in	מוומחות הופת מווחוות בחשבו	L. Acute cinical effects a	ale lespilatory little	HOII. CHIRCH STUDY	. Lewis 1992	-	definitionable college for the state of \$1000				1	-	1
**Chronic critical effects	are respiratory	**Chronic critical effects are respiratory irritation. Critical Study: Lewis 1992	ewis 1992											
				-							-			
	Dietance	Daily Acute Intake Value Daily Chronic Intake 'Acute Toxicity	Osily Chronic Intake	*Acute Toxicity	**Chronic Toxicity Value	Acute TRV	Chronic TRV	Acute TRV	Chronic	Chronic Dose	Acute	Chronic	Arite	Chronic
	(m)	(g/m³)	Value (g/kg-day)	Value (g/m³)	(g/m³)	Adjustment	Adjustment	(g/m³)	TRV (g/m³)	(g/kg-day)	Quotient	Quotient	Effect	Effect
Matemity Cave Inhalation	c													
	100		4.3E-08	0.25	0.25	-	160	2.5E-01	1.6E-03	5.3E-07	4.0E-02		ટ	Š
	300		2.1E-08	0.25	0.25	-	160	2.5E-01	1.6E-03	5.3E-07	2.0E-02		2	Š
	200		8.6E-09		0.25	-	160	2.5E-01	1.6E-03	5.3E-07	8.0E-03		2	Š
	700		4.3E-09	0.25	0.25	-	160	2.5E-01	1.6E-03	5.3E-07	4.0E-03	8.1E-03	2	Š
	1000	5.0E-04	2.1E-09	0.25	0.25	-	160	2.5E-01	1.6E-03	5.3E-07	2.0E-03	4.1E-03	ટ	2
	1400		8.6E-10	0.25	0.25	-	160	2.5E-01	1.6E-03	5.3E-07	8.0E-04	1.6E-03	S	Š
	1800	1.0E-04	4.3E-10	0.25	0.25	1	160	2.5E-01	1.6E-03	5.3E-07	4.0E-04	8.1E-04	2	2
*Acute toxicity value ass	umed equal to	Acute toxicity value assumed equal to unadjusted chronic LOAEL. Acute critical effects are respiratory imitation. Critical Study: Lewis 1992	L. Acute critical effects a	are respiratory irrita	tion. Critical Study	r: Lewis 1992								
**Chronic critical effects	are respirator	**Chronic critical effects are respiratory irritation. Critical Study: Lewis 1992	Lewis 1992											

Attachment H Risk Characterization - Bald Eagle

Attachment H: Fog Oil - Static Smoke

Bald eagle risk characterization for fog oil exposure under Pasquill Category B.

Distance Distance	Winter inhalation Water inhalation **Chronic critical effect is oil pneum **Chronic critical effects are min Winter ingestion (m)	Ce Daily Ac	ute Intake Value (g/m³)	Dally Chronic Intake Value (g/kg-day)	*Acute Toxicity	"Chronic	Acute TRV	Chronic TRV	Acute		A	Acute	Chronic		
Value (g/m²) (g/m²) Adjustment Adjustment (g/m²) TRV (g/m³) (g/m²) Quotient Effect	Winter Inhalation "Acute critical effect is oil pneum "Chronic critical effects are min Winter Ingestion (m)	000 000 000 000 000 000 000 000 000 00	(g/m³)	day}		CANCEL VINES	Uncertainty	Uncertainty	TRV	Chronic	Adjusted TRV	Hazard	Hazard	Acuto	Chronic
15E-05 60 0.1 3.2 3.20 1.88 3.1E-04 4.1E-04 5.5E-03 3.6E-03 No 1.5E-04	Winter Inhalation **Acute critical effect is oil pneum **Chronic critical effects are min **Winter Ingestion **Minter Ingestion **The critical effects are min **The critical effects ar	000 000 000 000 000 000 000 000 000 00	1.0E-02		Value (g/m³)	(g/m³)	Adjustment	Adjustment		TRV (g/m³)	(g/kg-day)	Quotient	Quotient	Effect	Effect
15E OF 650 0.1 3.2 3.20 1.88 3.1E-04 4.1E-04 5.3E-05 3.6E-05 No 7.2E-07 1.89 3.1E-04 4.1E-04 1.1E-04 7.2E-05 No 7.2E-04 1.1E-04 7.2E-05 0.0E-05 1.1E-04 0.0E-05 0.0E-0	Winter Ingestion Winter Ingestion Winter Ingestion	000 000 000 000 000 000 000 000 000 00	1.0E-02												
16.00 1.00	*Acute critical effect is oil pneum **Chronic critical effects are min **Chronic critical effects are min (m) Winter ingestion	000 000 000 000 000 000 000 000 000 00	2000	4 85 00	6	,				1		Ĺ	Ì		
15E-06 600 0.1 32 320 158 31E-04 41E-04 12E-03 158 100	*Acute critical effect is oil pneum **Chronic critical effects are min **Chronic critical effects are min **Thronic critical effects are min **Thronic critical effects are min **Thronic critical effect is oil pneum **Thronic critical effet is oil pneum **Thronic critical effet is oil pneum **Thronic critical effet is oil pneum **Thronic critical effet is oil pneum **Thronic critical effet is oil pneum **Thronic critical effet is oil pneum **Thronic critical effet is oil pneum **Thronic critical effet is oil pneum **Thro	000 000 000 000 000 000 000 000 000 00		7 26.07	8 8	r o	35	320	90.	3.1E-04	4.1E-04		-		2
150 150	"Acute critical effect is oil pneum "Chronic critical effects are min "Chronic critical effects are min "Winter Ingestion	000 000 000 000 onia. Critical Stu	2.0E-03	7.45-07	8 9	0	75	320	8 8	3.1E-04	4.1E-04	Ì			2
The color Color	"Acute critical effect is oil pneum "Chronic critical effects are min "Chronic critical effects are min "Minter Ingestion	000 000 000 onia Critical Stu	4.0E-03	7.95-0/	-	L'O	35	320	1.88	3.1E-04	4.1E-04	į	-	İ	2
156.06 600 011 22 320 188 31E-04 41E-04 13E-04 No 13E-04 13E-04 No 13E-04 13E-04 No 13E-04 13E-04 No 13E-04 13E-04 No 13E-04	*Acute critical effect is oil pneum **Chronic critical effects are min **Distate (m) Winter Ingestion	000 000 onia. Critical Stur	1.0E-03	70-12.1		0.1	32	320	88	3.1E-04	4.1E-04	Ì			2
15E-05 600	*Acute critical effect is oil pneum **Chronic critical effects are min **Chronic critical effects are min **Chronic critical effects are min **Chronic critical effect is oil pneum **Chronic critical effet is oil pneum **Chronic critical effet is oil pneum **Chronic critical effet is oil pneum **Chronic critical effet is oil pneum **Chronic critical effet is oil pneum **Chronic critical effet is oil pneum **Chronic critical effet is oil pneum *	000 onia. Critical Stur	5.UE-04	/.4E-08	9	0.1	32	320	88	3.1E-04	4.1E-04				2
15E-06 60 0.1 32 320 15E-06 4.1E-04 5.3E-05 3.EE-05 No	"Acute critical effect is oil pneum "Chronic critical effects are min "Chronic critical effects are min "Winter Ingestion "A	onia. Critical Stur	2.0E-04	2.9E-08	9	0.1	32	320	188	3.1E-04	4.1E-04				2
Character 11992 Character Character The Character The Character The Character Characte	*Acute critical effects are min **Chronic critical effects are min Dista (m) Winter Ingestion	onia. Critical Stud or lesions of the h	1.0E-04	1.5E-08	8	0.1	32	320	1.88	3.1E-04	4.1E-04				2
Chicago Chic	Acute diffical effects are min "Chronic critical effects are min (m) Winter ingestion	or lesions of the h	1007												
Character 1932 Character	Distar Winter Ingestion	r lesions of the h	dy: Shinn et al. 1987												
GEG-04 11 E-05	Dist		eart, liver and lungs.	Critical Study: Driver	et al. 1992										
Sec 04 17.6 22 32.00 0.5500 6.9E-03 1.9E-0		9		Daily Chronic	Acute Toucit.	"Chronic	Acute TRV	Chronic TRV	Acute			Acute	Chronic		
SEC 04 17.6 22 32 3200 0.5500 6.9E-03 1.9E-03 8.2E-02 No 1.EC-04 17.6 22 32 3200 0.5500 6.9E-03 9.7E-04 4.1E-02 No 5.FC-05 17.6 22 32 3200 0.5500 6.9E-03 9.7E-04 4.1E-02 No 2.FC-05 17.6 22 32 3200 0.5500 6.9E-03 9.7E-04 4.1E-02 No 2.BC-05 17.6 22 32 3200 0.5500 6.9E-03 9.7E-03 4.7E-03 No 2.BC-06 17.6 22 32 3200 0.5500 6.9E-03 9.7E-03 4.7E-03 No 5.BC-06 17.6 22 32 3200 0.5500 6.9E-03 9.7E-04 4.7E-03 No 5.BC-07 17.6 22 32 3200 0.5500 6.9E-03 1.9E-03 8.4E-04 No 16c-08 17.6 17			intake Value (g/kg)		Value (g/kg)	(g/kg)	Adjustment	Adjustment	(g/kg)	Chronic	: TRV (g/kg)	Aazard Quotient	Hazard Quotient	Acute	Chronic
SEE-04 17.6 22 32 3200 0.5500 6.8E-03 1.9E-03 0.7E-04 4.1E-02 No 2.0E-04 17.6 22 32 3200 0.5500 6.9E-03 9.7E-04 4.1E-02 No 5.7E-05 17.6 22 32 3200 0.5500 6.9E-03 3.9E-03 1.7E-03 No 2.8E-05 17.6 22 32 3200 0.5500 6.9E-03 3.9E-03 1.7E-03 No 2.8E-05 17.6 22 32 3200 0.5500 6.9E-03 3.9E-05 1.7E-03 No 2.8E-05 17.6 22 32 3200 0.5500 6.9E-03 3.9E-03 1.7E-03 No 5.8E-06 17.6 22 32 3200 0.5500 6.9E-03 3.9E-03 1.7E-03 No 5.8E-06 17.6 22 32 3200 0.5500 6.9E-03 3.9E-03 1.7E-03 No 5.8E-07 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>															
2 BE-04 17.6 22 32 3200 6.5500 6.9E-03 3.7E-04 4.1E-02 No 5.7E-05 17.6 22 32 3200 0.5500 6.9E-03 3.9E-04 1.7E-02 No 5.7E-05 17.6 22 32 3200 0.5500 6.9E-03 3.9E-04 1.7E-03 No 5.8E-06 17.6 22 32 3200 0.5500 6.9E-03 3.9E-04 1.7E-03 No 5.8E-06 17.6 22 32 3200 0.5500 6.9E-03 3.9E-05 1.7E-03 No 5.8E-06 17.6 22 32 3200 0.5500 6.9E-03 3.7E-05 8.4E-04 No 5.8E-06 17.6 22 32 3200 0.5500 6.9E-03 3.7E-05 8.4E-04 No 5.8E-08 Adute TRV Chronic TRV Adute TRV Chronic TRV Adute TRV Chronic TRV Adute TRV Chronic TRV Chronic TRV Chronic TRV			1.1E-03	5.6E-04	17.6	22	32	3200	0.5500	_ d	9E-03	1 05.03		:	C.A.
11E-04 176 22 32 3200 0.5500 6.9E-03 3.9E-04 1.7E-02 No 1.7E-05 1.7E 22 32 3200 0.5500 6.9E-03 3.9E-04 No 1.7E-05 1.7E 22 32 3200 0.5500 6.9E-03 3.9E-04 No 1.7E-05 1.7E 22 32 3200 0.5500 6.9E-03 3.9E-04 No 1.7E-05 1.7E 22 32 3200 0.5500 6.9E-03 1.9E-05 8.4E-04 No 1.7E-05 1.7E 22 32 3200 0.5500 6.9E-03 1.9E-05 8.4E-04 No 1.7E-05 1.7E-05 1.7E-05 No 1.7E-05 1.7E-05 1.7E-03 No 1.7E-05 1.7E-07 1.7E-07 No 1.7E-05 1.7E-07 1.7E-07 No 1.7E-05 1.7E-07 No 1.7E-05 1.7E-07 No 1.7E-05 1.7E-07 No 1.7E-05 1.7E-07 No 1.7E-05 1.7E-07 No 1.7E-05 1.7E-07 No 1.7E-07 1.7E-07 No 1			5.4E-04	2.8E-04	17.6	22	32	3200	0.5500	0	95-03	9.7E-04	i	-	N
5.7E-05 17.6 22 32 3200 0.5500 6.9E-03 1.9E-04 8.3E-03 No 1.5E-05 17.6 22 32 3200 0.5500 6.9E-03 3.9E-05 1.7E-03 No 5.8E-05 17.6 22 32 3200 0.5500 6.9E-03 1.9E-04 No 5.8E-06 17.6 22 32 3200 0.5500 6.9E-03 1.9E-05 8.4E-04 No 5.8E-06 17.6 17.6 32 3200 0.5500 6.9E-03 1.9E-05 8.4E-04 No 16c-1 17.6 17.6 32 3200 0.5500 6.9E-03 1.9E-05 8.4E-04 No 16c-1 Acute Toxicity Acute Toxicity Acute Toxicity Acute Toxicity Acute Toxicity Acute Toxicity Acute Toxicity Acute Toxicity Acute Toxicity Acute Toxicity Acute Toxicity Acute Toxicity Acute Toxicity Acute Toxicity Acute Toxicity Acute Toxicity Acute Toxicity <			2.1E-04	1.1E-04	17.6	22	32	3200	0.5500	9	9E-03	3.9E-04			N
176 22 32 3200 0.5500 6.9E-03 3.9Te-05 1.7E-03 No 11E-05 176 22 32 3200 0.5500 6.9E-03 3.9E-05 1.7E-03 No 568E-06 176 22 32 3200 0.5500 6.9E-03 3.9E-05 1.7E-03 No steel-06 176 22 32 3200 0.5500 6.9E-03 3.9E-05 1.7E-03 No steel-08 176 176 178			1.1E-04	5.7E-05	17.6	22	32	3200	0.5500	9	9E-03	1.9E-04			No
11E-05 17.6 22 32 3200 0.5500 6.9E-03 3.9E-05 1.7E-05 No 5.8E-06 17.6 22 32 3200 0.5500 6.9E-03 1.9E-05 8.4E-04 No sitcal Study: Bramachari 1956 "Chronic TRV glave Uncertainty Uncertainty Uncertainty Uncertainty Uncertainty Hazard TRV Hazard Hazard Hazard Hazard Hazard Hazard Hazard Adjustment Adjustment Adjustment Adjustment (glkg) Chronic TRV (glkg) Acute Outlent Acute Chronic TRV (glkg) Chronic TRV (glkg) Acute Chronic TRV (glkg) <	_		5.4E-05	2.9E-05	17.6	22	32	3200	0.5500	9	9E-03	9.7E-05		1	S
1.0 1.0			2.1E-05	1.1E-05	17.6	22	32	3200	0.5500	Ó	9E-03	3.9E-05		ļ	No
Study: Bramachari 1956 "Chronic TRV Chronic TRV Chronic TRV Chronic TRV Chronic TRV Chronic TRV (g/kg) Chron	2		1.1E-05	5.8E-06	17.6	22	32	3200	0.5500	9.	9E-03	1.9E-05			No
Section Sect	*Acute critical effects are weight	loss and lesions o	of the liver soleen ar		خا	28									
**Ohronic Acute TRV Chronic TRV Acute TRV Acute TRV Chronic TRV Acute Toxicity Value (g/kg) Acute Toxici	**Chronic critical effect is gastro	ntestinal irritation.	Critical Study: Lew		SI.				i			:			
Page Page		,	-												
3-day Value (g/kg) (g/kg) Chronic TRV (g/kg) Ch	Distar				*Acute Toxicity	**Chronic	Acute TRV	Chronic TRV	Acute			Acute	Chronic	- 4	č
4.9E-06 2 216 32 320 0.0625 6.8E-01 1.6E-01 7.3E-06 No 2.6E-06 2 2.16 32 320 0.0625 6.8E-01 3.7E-02 3.7E-06 No 9.9E-07 2 2.16 32 320 0.0625 6.8E-01 3.7E-02 1.5E-07 No 4.9E-07 2 2.16 32 320 0.0625 6.8E-01 1.6E-02 7.3E-07 No 9.9E-08 2 2.16 32 320 0.0625 6.8E-01 1.6E-02 7.3E-07 No 9.9E-08 2 2.16 32 320 0.0625 6.8E-01 3.2E-02 7.3E-07 No 4.9E-08 2 2.16 32 320 0.0625 6.8E-01 3.2E-02 7.3E-07 No 4.9E-08 2 2.16 32 320 0.0625 6.8E-01 1.6E-02 7.3E-07 No 4.9E-08 2 2.16 <t< td=""><td>Œ)</td><td></td><td></td><td></td><td>Value (g/kg)</td><td>(g/kg)</td><td>Adjustment</td><td>Adjustment</td><td>(g/kg)</td><td>Chronic</td><td>: TRV (g/kg)</td><td>Quotient</td><td>Quotient</td><td>Effect</td><td>Effect</td></t<>	Œ)				Value (g/kg)	(g/kg)	Adjustment	Adjustment	(g/kg)	Chronic	: TRV (g/kg)	Quotient	Quotient	Effect	Effect
4.0E-06 2 216 32 320 0.0625 6.8E-01 1.6E-01 7.3E-06 No 2.6E-06 2 2.16 32 320 0.0625 6.8E-01 3.7E-02 3.7E-06 No 9.9E-07 2 2.16 32 320 0.0625 6.8E-01 3.7E-02 1.5E-06 No 4.9E-07 2 2.16 32 320 0.0625 6.8E-01 1.6E-02 7.3E-07 No 9.9E-08 2 2.16 32 320 0.0625 6.8E-01 8.0E-02 7.3E-07 No 9.9E-09 2 2.16 32 320 0.0625 6.8E-01 3.2E-02 7.3E-07 No 4.9E-08 2 2.16 32 320 0.0625 6.8E-01 1.6E-02 7.3E-07 No 4.9E-08 2 2.16 32 320 0.0625 6.8E-01 1.6E-02 7.3E-09 No 4.9E-08 2 2.16 <t< td=""><td>Wester Democratic</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	Wester Democratic														
2.6E-06 2 2.16 3.2 3.20 0.0625 6.8E-01 1.0E-01 7.3E-06 No 9.9E-07 2 2.16 3.2 3.20 0.0625 6.8E-01 3.2E-02 1.5E-07 No 4.9E-07 2 2.16 3.2 3.2 3.0 0.0625 6.8E-01 1.6E-02 7.3E-07 No 9.9E-08 2 2.16 3.2 3.2 0.0625 6.8E-01 1.6E-02 7.3E-07 No 9.9E-08 2 2.16 3.2 3.2 0.0625 6.8E-01 3.2E-02 7.3E-07 No 4.9E-08 2 2.16 3.2 3.2 0.0625 6.8E-01 3.2E-03 7.3E-07 No 4.9E-08 2 2.16 3.2 3.2 0.0625 6.8E-01 1.6E-03 7.3E-06 No 4.9E-08 2 2.16 3.2 0.0625 6.8E-01 1.6E-03 7.3E-06 No		1	-	1	!	370							:		;
9.9E-07 2 216 32 320 0.0525 6.8E-01 3.2E-02 1.5E-07 No 4.9E-07 2 2.16 32 320 0.0625 6.8E-01 1.6E-02 7.3E-07 No 2.5E-07 2 2.16 32 320 0.0625 6.8E-01 1.6E-02 7.3E-07 No 9.9E-08 2 2.16 32 320 0.0625 6.8E-01 3.2E-03 7.5E-07 No 4.9E-08 2 2.16 32 320 0.0625 6.8E-01 3.2E-03 7.5E-07 No 4.9E-08 2 2.16 32 320 0.0625 6.8E-01 1.6E-03 7.3E-07 No 1999 32 320 0.0625 6.8E-01 1.6E-03 7.3E-08 No						216	35	320	0.0025	0 4	00-01	מט שט פ	-	;	2
4 9E-07 2 216 32 320 0.0625 6.8E-01 1.6E-02 7.3E-07 No 2 5E-07 2 2.16 32 32 0.0625 6.8E-01 8.0E-03 3.7E-07 No 4.9E-08 2 2.16 32 320 0.0625 6.8E-01 3.2E-07 No 4.9E-08 2 2.16 32 320 0.0625 6.8E-01 1.6E-07 7.3E-07 No 1999 32 320 0.0625 6.8E-01 1.6E-03 7.3E-08 No					2	216	32	320	0.0025	9	8F-01	3.2F.02			2 2
2 5E-07 2 216 32 320 0.0625 6.8E-01 8.0E-03 3.7E-07 No 9.9E-08 2 2.16 32 320 0.0625 6.8E-01 3.2E-03 1.5E-07 No 4.9E-08 2 2.16 32 320 0.0625 6.8E-01 1.5E-03 7.3E-08 No 1999 1999 1999 1990					2	216	32	320	0.0625	9	8E-01	16E-02		1	N
4.9E-08 2 216 32 320 0.0625 6.8E-01 3.2E-03 1.5E-07 No 4.9E-08 2 2.16 32 320 0.0625 6.8E-01 1.6E-03 7.3E-08 No 1989 1989 1989 1989 1980						216	32	320	0.0625	9	8E-01	8.0E-03	ļ		2
4.9E-08 2 216 32 320 0.0625 6.8E-01 1.6E-03 7.3E-08 No 1989 1989 1989 1989 1980 <						216	32	320	0.0625	6.	8E-01	3.2E-03			2
1989	2					216	32	320	0.0625	6.	8E-01	1.6E-03	İ	-	S
Acute critical effects arewell defined erythema and edema. Critical Study: Lewis 1989	33														
CHROTHIC GROUND BETWEEN US HIGHER ALL CHROAD SUMD. LEWIS 1909	Acute critical effects slight to n	oderate skin irrita	ation. Critical Study:	Palmer 1990											
	מויים מייים פויים פויים פויים	delilied etytilelila	and ederlia. Critical	Sindy. Lewis 1909											

Bald eagle risk characterization for fog oil exposure under Pasquill Category B.

				Daily Chronic		**Chronic	Acute TRV	Chronic TRV	Acute		Chronic Dose	Acute	Chronic	-	
	Distance (m)	Daily Acute Intake Value (o/m³)		Intake Value (g/kg-	*Acute Toxicity Value (a/m³)	Toxicity Value (a/m³)	Uncertainty	Uncertainty	(a/m²)	Chronic TRV (q/m³)	Adjusted TRV (q/kq-dav)	Hazard	Hazard Quotient	Acute Effect	Chronic Effect
								┢							
Summer Inhalation										ľ					
South Nest	20229	0.0E+00	8	0.0E+00	9	0.1	32	320	1.88	3.1E-04	4.1E-04	0.0E+00	0.0E+00	2	S
Mid Nest	23638	0.0E+00	8	0.000	09	0.1	32	320	1.88	3.15-04	4.15-04	0.0E+00	0.0E+00	2	N _O
North Nest	45057	0.0E+00	8	0.0E+00	09	0.1	32	320	1.88	3.1E-04	4.1E-04	0.0E+00	0.0E+00	S	S
*Acute critical effect is oil pneumonia. Critical Study: Shinn et al. 1987	vil pneumonia.	Critical Study: Sh	vinn et al. 1987												
**Chronic critical effects are minor lesions of the heart, liver and lungs. Critical Study: Driver	are minor les	ions of the heart, liv	ver and lungs.		et al. 1992										
	Distance	Daily Acute Intake Value	Skin Surface	Skin Surface Demally absorbed	*Acute Toxicity	**Chronic Toxicity Value	Acute TRV Uncertainty	Chronic TRV Uncertainty	Acute			Acute Hazard	Chronic	Acute	Chronic
	Œ	(g/m²)	Area (m²)	dose (g/kg-day)	Value (g/kg)	(g/kg)	Adjustment	Adjustment	(g/kg)	Chroni	Chronic TRV (g/kg)	Quotient	Quotient	Effect	Effect
Summer Dermal Absorption	otion														
South Nest	20229	1.05-04	2.8E-01	6.9E-08	2	216	32	320	90.0		6.8E-01	1.6E-03	1.0E-07	2	ž
Mid Nest		0.0E+00	2.8E-01	00.0E+00	2	216	32	320	0.08		6.8E-01	0.0E+00	0.0E+00	욷	Š
North Nest	45057	0.0E+00	2.8E-01	0.0E+00	2	216	32	320	90.0		6.8E-01	0.0E+00	0.0E+00	£	Š
*Acute critical effect is slight to moderate skin irritation. Critical Study: Palmer 1990	slight to moder	rate skin irritation.	Critical Study:	Palmer 1990											
"Chronic critical effects arewell defined erythema and edema. Critical Study: Lewis 1989	s arewell defin	ed enythema and e	dema. Critical	Study: Lewis 1989											

Bald eagle risk characterization for fog oil exposure under Pasquill Category C.

Charlet Char	Static Stillore															
1,000 1,00		Distance	Daily Acute I	ntake Value	Daily Chronic Intake Value (g/kg-	*Acute Toxicity	**Chronic Toxicity Value	Acute TRV Uncertainty	Chronic TRV Uncertainty		Chronic	Chronic Dose Adjusted TRV	Acute	Chronic	Acute	Chronic
100 100		Ē	wg)		day)	Value (g/m²)	(g/m²)	Adjustment	Adjustment		RV (g/m²)	(g/kg-day)	Quotient	Quotient	Effect	Effect
10 10 10 10 10 10 10 10	nter Inhalation															
1,000 2,00		3500		-02	1.5E-06	09	0.1		320	1.88	3.1E-04	4.1E-04	5.3E-03			ž
1,500 1,00		3500		-03	7.4E-07	90	0.1		320	1.88	3.1E-04	4.1E-04	2.7E-03			ž
1500 10E-03 10E-04 12E-04 12E-04 10E-04 12E-04 12E-04 10E-04 12E-04 12E-04 10E-04 12E		4000		-03	2.9E-07	9	0.1	32	320	1.88	3.16-04	4.1E-04	1.1E-03			ž
17500 50.00-4 17500 17500 17500		2500		-03	1.5E-07	9	0.1	32	320	1.88	3.1E-04	4.1E-04	5.3E-04			ž
1,200 2,000 1,00		7500		-04	7.4E-08	09	0.1	32	320	1.88	3.1E-04	4.1E-04	2.7E-04			ž
1950 10 E-04 11 E-04		12000		\$	2.9E-08	9	0.1	32	320	1.88	3.1E-04	4.1E-04	1.1E-04			S
Figure Distance Chical Study Shirin et al. 1987 Chical Study Chical		18500		\$	1.5E-08	9	0.1	32	320	1.88	3.1E-04	4.1E-04	5.3E-05			Z
Daily Acute Intake Value (gAg)	ute critical effect is	oil pneumonia.	Critical Study: S	thinn et al. 1987												
Distance Daily Acute Intake Value (g/kg) Acute Intak	hronic critical effec	ts are minor le	sions of the heart,	liver and lungs.	Critical Study: Driver											
Chical Chical		300			Daily Chronic	To letter	**Chronic	Acute TRV	Chronic TRV	Acute			Acute	Chronic		
1 1 2 2 2 2 2 2 2 2		(m)	Daily Acute Intai	ke Value (g/kg)	milane value (g/ng- day)	Value (g/kg)	(g/kg)	Adjustment	Adjustment	(g/kg)	Chronic	TRV (g/kg)	Quotient	Quotient	Effect	Effect
Sign																
Fig. 2 Fig. 4 Fig. 5 Fig. 6 F	ilei irigestion	3500		-03	5.6E-04	-			3200	0.5500	_ (0	DE 03	1 OF 02			1
5500 21E-04 11E-04 17 6 22 320 0.5500 6.8E-03 3.9E-04 1.7E-02 No 12000 51.E-04 2.7E-04 2.7E-05 17.6 2.2 32 3200 6.5500 6.9E-03 3.7E-05 1.7E-04 No 12000 5.1E-05 1.1E-05 1.7E-05 1.7E-05 1.7E-05 1.7E-03 No 24000 1.1E-05 1.1E-05 1.7E-05 1.7E-05 1.7E-03 No 24000 1.1E-05 1.7E-05 1.7E-05 1.7E-05 1.7E-03 No 24000 1.1E-05 1.7E-05 1.7E-05 1.7E-05 1.7E-03 No 24000 1.1E-05 1.7E-05 1.7E-05 1.7E-05 1.7E-03 No 1.7E-03 No 1.1E-05 1.1E-05 1.7E-05 1.7E-05 1.7E-05 1.7E-04 No 1.7E-03 No 1.7E-03 No 1.7E-03 No 1.7E-03 No 1.7E-03 No 1.7E-03 No <td></td> <td></td> <td></td> <td>Ş</td> <td>2.86-04</td> <td></td> <td></td> <td></td> <td>-</td> <td>0.5500</td> <td>910</td> <td>9E-03</td> <td>9.7E-04</td> <td>1</td> <td>;</td> <td></td>				Ş	2.86-04				-	0.5500	910	9E-03	9.7E-04	1	;	
Second 11 E-04 5 1 E-04 5 1 E-04 5 1 E-04 5 1 E-04 5 1 E-04 5 1 E-04 5 1 E-04 5 1 E-04 5 1 E-04 5 1 E-04 5 1 E-04 5 1 E-04 5 1 E-04 5 1 E-04 5 1 E-04 5 1 E-05 1		9200		4	1.15-04				3200	0.5500	9	9E-03	3.9E-04			!
12000 5.66-05 2.66-0		8000		-04	5.7E-05				3200	0.5500	9	9E-03	1.9E-04			1
24000 2.1E-05 1.1E-0		12000		-05	2.9E-05	17.6			3200	0.5500	9	9E-03	9.7E-05			
1.1E-05 1.1E-05 1.0E-05 1.1E-05 1.1E-05 1.0E		24000		-05	1.1E-05				3200	0.5500	9	9E-03	3.9E-05			ž
Patient Pati		40000		-05	5.8E-06				3200	0.5500	9	9E-03	1.9E-05			ž
Pastroiniestinal irritation. Critical Study. Lewis 1989 Acute Toxicity Value (g/kg) Acute	ute critical effects	Tre weight loss	and lesions of the	liver, spleen, an	d kidney. Critical Stud	1 :2	58							į		
Daily Acute Intake Value Skin Surface Intake Value Skin Surface Intake Value Skin Surface Intake Value Skin Surface Intake Value Skin Surface Intake Value Skin Surface Intake Value Skin Surface Intake Value Intak	hronic critical effec	t is gastrointes	inal irritation. Crit	ical Study: Lewi	.	ĹĹ			:					.		:
Chiconic Distance Infake Value Skin Surface Chiconic Distance Infake Value Skin Surface Chiconic Distance Infake Value Skin Surface Chiconic Distance Infake Value Skin Surface Chiconic Distance Chiconic Distance Infake Value Skin Surface Chiconic Distance Chiconic Dista			Perili A													
(m) (g/m³) Area (m²) Area (m		Distance	Intake Value	Skin Surface	Dermally absorbed	•Acute Toxicity	Toxicity Value	Acute TRV Uncertainty	Chronic TRV Uncertainty	Acute			Acute	Chronic	Acute	Chronic
3500 1.0E-02 2.8E-01 4.9E-06 2 216 32 320 0.0625 6.8E-01 1.0E-01 7.3E-06 No 4000 5.0E-03 2.8E-01 2.5E-06 2 216 32 320 0.0625 6.8E-01 7.3E-06 No 5500 5.0E-03 2.8E-01 9.9E-07 2 2.16 32 320 0.0625 6.8E-01 3.7E-05 No 5000 1.0E-04 2.8E-01 2.5E-07 2 2.16 32 320 0.0625 6.8E-01 3.7E-05 No 24000 5.0E-04 2.8E-01 9.9E-09 2 2.16 32 320 0.0625 6.8E-01 3.7E-03 1.0E-04 1.0E-04 3.7E-03 3.7E-07 No 24000 1.0E-04 2.8E-01 4.9E-08 2 2.16 32 320 0.0625 6.8E-01 3.7E-03 3.7E-07 No 40000 1.0E-04 2.8E-01 4.9E-08 2 2.16		Ē	(g/m²)	Area (m²)	dose (g/kg-day)	Value (g/kg)	(g/kg)	Adjustment	Adjustment	(g/kg)	Chronic	: TRV (g/kg)	Quotlent	Quotient	Effect	Effect
3500 1.0E-02 2.8E-01 4.9E-06 2 216 32 320 0.625 6.8E-01 1.0E-01 7.3E-05 No 4000 5.0E-03 2.8E-01 2.5E-06 2 2.16 32 320 0.0625 6.8E-01 7.3E-06 No 8500 2.0E-03 2.8E-01 4.9E-07 2 2.16 32 320 0.0625 6.8E-01 3.2E-02 1.5E-06 No 12000 5.0E-04 2.8E-01 4.9E-07 2 2.16 32 320 0.0625 6.8E-01 1.6E-02 7.3E-06 No 24000 5.0E-04 2.8E-01 4.9E-07 2 2.16 32 320 0.0625 6.8E-01 1.6E-07 7.3E-07 No 40000 1.0E-04 2.8E-01 4.9E-08 2 2.16 32 320 0.0625 6.8E-01 3.7E-07 No 40000 1.0E-04 2.8E-01 4.9E-08 2 2.16 32 320	iter Dermal Absorp	figu														
6 2 216 32 320 0.0625 6.8E-01 8.0E-02 3.7E-06 No 7 2 216 32 320 0.0625 6.8E-01 1.6E-02 1.5E-06 No 7 2 216 32 320 0.0625 6.8E-01 1.6E-02 1.5E-06 No 8 2 216 32 320 0.0625 6.8E-01 3.2E-03 3.7E-07 No 8 2 216 32 320 0.0625 6.8E-01 3.2E-03 1.5E-07 No 8 2 216 32 320 0.0625 6.8E-01 3.2E-03 1.5E-07 No 9 2 216 32 320 0.0625 6.8E-01 1.6E-03 7.3E-08 No					4.9E-06	2			320	-	9	8E-01	1.6E-01		İ	ž
7 2 216 32 320 0.0625 6.8E-01 3.2E-02 1.5E-06 No 7 2 216 32 320 0.0625 6.8E-01 1.6E-02 7.3E-07 No 8 2 216 32 320 0.0625 6.8E-01 3.2E-03 7.3E-07 No 8 2 216 32 320 0.0625 6.8E-01 3.2E-03 7.5E-07 No 8 2 216 32 320 0.0625 6.8E-01 1.6E-03 7.3E-07 No		4000			2.5E-06	2			320		9	8E-01	8.0E-02			ž
7 2 216 32 320 0.0625 6.8E-01 1.6E-02 7.3E-07 No 7 2 216 32 320 0.0625 6.8E-01 8.0E-03 3.7E-07 No 8 2 216 32 320 0.0625 6.8E-01 3.2E-03 1.5E-07 No 8 2 216 32 320 0.0625 6.8E-01 1.6E-03 7.3E-08 No		5500			9.9E-07				320		Ġ	8E-01	3.2E-02			ž
7 2 216 32 320 0.0625 6.8E-01 8.0E-03 3.7E-07 No 8 2 2.16 32 320 0.0625 6.8E-01 3.2E-03 1.5E-07 No 8 2 2.16 32 320 0.0625 6.8E-01 1.6E-03 7.3E-08 No		8000			4.9E-07				320		9	8E-01	1.6E-02			ž
8 2 216 32 320 0.0625 6.8E-01 3.2E-07 No 8 2 216 32 320 0.0625 6.8E-01 1.6E-03 7.3E-08 No		12000			2.5E-07	2			320	-	9	8E-01	8.0E-03			ž
8 2 216 32 320 0.0625 6.8E-01 1.6E-03 7.3E-08 No		24000			90-36-08				320	1	9	8E-01	3.2E-03	-		ž
sude critical effect is slight to moderate skin irritation. Critical Study: Palmer 1990 Amonic critical effects are well defined erythema and edema. Critical Study: Lewis 1989		40000			4.9E-08				320		9	8E-01	1.6E-03			ž
hronic critical effects are well defined enythema and edema. Critical Study: Lewis 1989	ute critical effect is	slight to mode.	rate skin irritation.	Critical Study:	Palmer 1990											
	hronic critical effec	te are well defin	bus smathan bar	Adama Critical	Chicke 1 partie 1000											

Bald eagle risk characterization for fog oil exposure under Pasquill Category C.

	Distance (m)	Daily Acute Intake Value (g/m³)		Daily Chronic Intake Value (g/kg- day)	*Acute Toxicity Value (g/m³)	**Chronic Toxicity Value (g/m³)	Acute TRV Uncertainty Adjustment	Chronic TRV Uncertainty Adjustment	Acute TRV (g/m³)	Chronic TRV (g/m³)	Chronic Dose Adjusted TRV (g/kg-day)	Acute Hazard Quotient	Chronic Hazard Quotient	Acute	Chronic Effect
Summer Inhalation								-							
South Nest	20229	0.0E+00	8	0.0E+00	9	0.1	32	320	1.88	3.1E-04	4.1E-04	0.0E+00	0.0E+00	ટ	Š
Mid Nest	23638		8	0.0E+00	8	0.1	32	320	1.88	3.16-04	4.1E-04			2	ž
North Nest	45057	0.0E+00	8	0.0E+00	09	0.1	32	320	1.88	3.15-04	4.1E-04	0.0E+00	0.0E+00	2	S.
*Acute critical effect is oil pneumonia. Critical Study. Shinn et al. 1987	oil pneumonia.	Critical Study: St	ninn et al. 1987												
*Chronic critical effects are minor lesions of the heart, liver and lungs. Critical Study: Driver	s are minor les	ions of the heart, it	ver and lungs.	٠.	et al. 1992									:	
	i	Daily Acute	Skin Sudace	_			Acute TRV	Chronic TRV	Acute			Acute	Chronic		1
	Distance (m)		Area (m²)	Area (m²) dose (g/kg-day)	Value (g/kg)	loxicity Value (g/kg)	Uncertainty Adjustment	Uncertainty Adjustment	(g/kg)	Chronic	Chronic TRV (g/kg)	Quotient	Quotient	Acute	Effect
Summer Dermal Absorption	ption														
South Nest	t 20229	2.05-04	2.8E-01	1.4E-07	2	216	32	320	90.0	9	6.8E-01	3.2E-03	2.1E-07	S S	£
Mid Nest	1 23638	2.06-04	2.8E-01	1.4E-07	2	216	32	320	90.0	9	6.8E-01	3.2E-03	2.1E-07	Š	Š
North Nest	45057	0.05+00	2.8E-01	0.0E+00	2	216	32	320	90.0	9	6.8E-01	0.0E+00	0.0E+00	No	Š
*Acute critical effect is slight to moderate skin irritation. Critical Study: Palmer 1990	slight to moder	rate skin irritation.	Critical Study: 1	Palmer 1990											
**Chronic critical effects are well defined erythema and edema. Critical Study: Lewis 1989	s are well defir	ned enythema and	edema. Critical	Study: Lewis 1989											

Bald eagle risk characterization for fog oil exposure under Pasquill Category D.

Static Smoke	_														
	Distance (m)	Daily Acute Intake Value	ntake Value	Daily Chronic Intake Value (g/kg-dav)	*Acute Toxicity Value (o/m³)	**Chronic Toxicity Value	Acute TRV Uncertainty Adjustment	Chronic TRV Uncertainty Adjustment	Acute TRV (q/m³)	Chronic TRV (q/m³)	Chronic Dose Adjusted TRV (q/kq-dav)	Acute Hazard Quotient	Chronic Hazard Quotient	Acute	Chronic
									1-						
Winter Inhalation															
	3500	1.0E-02	-02	1.5E-06		0.1			1.88	3.1E-04	4.1E-04			2	S
	4500		-03	7.4E-07	8	0.1			1.88	3.1E-04	4.1E-04		1.8E-03	2	Š
	6500		-03	2.9E-07	09	0.1			1.88	3.1E-04	4.1E-04		7.2E-04	Š	Š
	8500		-63	1.5E-07	9	0.1			1.88	3.1E-04	4.1E-04		3.6E-04	2	S N
	12500	5.0E-04	\$	7.4E-08	9	0.1			1.88	3.1E-04	4.1E-04			ž	ž
	22500	2.0E-04	\$	2.9E-08		0.1			1.88	3.1E-04	4.16-04			ş	Š
	35500		2	1.5E-08	09	0.1	32	320	1.88	3.1E-04	4.1E-04	5.3E-05	3.6E-05	2	2
Acute critical effect is oil pneumonia.	oil pneumonia	Critical Study	Shinn et al. 1987											:	; ;
"Chronic critical effects are minor lesions of the hear, liver and lungs.	ts are minor lex	sions of the heart,		Critical Study: Driver et	et al. 1992										!!!
	Distance			Daily Chronic	*Acute Toxicity	**Chronic	Acute TRV Uncertainty	Chronic TRV Uncertainty	Acute			Acute	Chronic	Acute	Chronic
	(E)	Daily Acute Intake Value (g/kg)	ke Value (g/kg)		Value (g/kg)	(g/kg)	Adjustment	Adjustment	(g/kg)	Chroni	Chronic TRV (g/kg)	Quotient	Quotient	Effect	Effect
Winter Indestion														-	
	6500	1.1E-03	-03	5.6E-04	17.6			3200	0.5500	9	3.9E-03	1.9E-03	8.2E-02	2	2
	8500	5.4E-04	\$	2.8E-04				3200	0.5500	9	.9E-03	9.7E-04			S
	14000		\$	1.1E-04	17.6	22	32	3200	0.5500	6.	1.9E-03	3.9E-04	1.7E-02	2	2
	22000	1.1E-04	\$	5.7E-05	17.6			3200	0.5500	Э	6.9E-03	1.9E-04			2
	35500		-05	2.9E-05	17.6			3200	0.5500	Ġ	3.9E-03	9.7E-05			2
	\$0000÷		-05	1.1E-05	17.6			3200	0.5500	S	6.9E-03	3.9E-05	-		2
	++00005	1.1E-05	-05	5.8E-06	17.6			3200	0.5500	9	.9E-03	1.9E-05		-	2
cute critical effects	are weight loss	and lesions of the	liver, spleen, an	Acute critical effects are weight loss and lesions of the liver spleen, and kidney. Critical Study:	dv: Bramachari 1958	158									
"Chronic critical effect is gastrointestinal irritation. Critical Study: Lewis 1989	t is gastrointes	tinal irritation. Criti	ical Study: Lewi	s 1989	i 1										
	Distance	Dally Acute Intake Value	Skin Surface	Dermally absorbed *Acute Toxicity	*Acute Toxicity	"Chronic Toxicity Value	Acute TRV Uncertainty	Chronic TRV Uncertainty	Acute			Acute	Chronic	Acute	Chronic
	Œ	(g/m²)	Area (m²)		Value (g/kg)	(g/kg)	Adjustment	Adjustment	(g/kg)	Chron	Chronic TRV (g/kg)	Quotient	Quotient	Effect	Effect
Minter Dermal Absorption	disp.													-	
	6500	1.0E-02	2.8E-01	4.9E-06				320	0.0625		6.8E-01	1.6E-01	7.3E-06	£	ž
	8500			2.5E-06						J	3.8E-01	8.0E-02			Ž
	14000			9.9E-07				320	ļ		6.8E-01	3.2E-02	į	į	2
	22000			4.9E-07					į	* 10000000	6.8E-01	1.6E-02		<u>;</u>	2
	35500				2	216	32				3.8E-01	8.0E-03			2
	\$0000÷							320			6.8E-01	3.2E-03	1.5E-07	***************************************	2
	\$0000÷+	1.0E-04	2.8E-01	4.9E-08					0.0625		6.8E-01	1.6E-03			2
Acute critical effects is slight to moderate skin imitation. Critical Study. Palmer 1990	is slight to mod	erate skin irritation	Critical Study	Palmer 1990											
Chronic critical effec	te are well defi	hed endhams and	odema Critica	"Chronic critical effects are well defined envihema and edema. Critical Study: Lewis 1989											
	**** *** ***								,					A STATE OF THE PARTY OF	*

Bald eagle risk characterization for fog oil exposure under Pasquill Category D.

	Distance	Daily Acute Intake Value		Daily Chronic Intake Value (g/kg-	*Acute Toxicity	**Chronic Toxicity Value	Acute TRV Uncertainty	Chronic TRV Uncertainty	Acute TRV	Chronic	Chronic Dose Adjusted TRV	Acute Hazard	Chronic Hazard	Acute	Chronic
	Ê	(g/m²)		day)	Value (g/m³)	(g/m²)	Adjustment	Adjustment	(g/m²)	TRV (g/m³)	(g/kg-day)	Quotient	Quotient	Effect	Effect
Summer Inhalation															
South Nest	20229	2.0E-04	75	4.1E-08	8	0.1	32	320	1.88	3.1E-04	4.1E-04	1.1E-04	1 0F-04	S.	N.
Mid Nest	23638	1.0E-04	7	2.1E-08	09	0.1	32	320	1.88	3.16-04	4.1E-04	5.3E-05		2	2
North Nest	45057	0.0E+00	8	0.0E+00	9	0.1	32	320	1.88	3.1E-04	4.1E-04	0.0E+00	ľ	£	2
Aprile critical effect is all measurements Critical Study. China et al. 1087	eioomisoo lic	Critical Study: Ch	Tool 1087												
bronic critical effects	are minor les	ione of the board lis	min et al. 1507	**Chronic critical effects are minor factors of the bood lines and lines. Children Delines	4000										
יויסווס מיוויסון סווסכוי	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	ומנו מופ וופשור ו	Ver and rengs.		el al. 1992										
	Distance	Daily Acute Intake Value	Skin Surface	Skin Surface Dermally absorbed	*Acute Toxicity	"Chronic Toxicity Value	Acute TRV Uncertainty	Chronic TRV	Acute			Acute	Chronic	Acute	Chronic
	(m)	(g/m²)	Area (m²)	dose (g/kg-day)	Value (g/kg)	(g/kg)	Adjustment	Adjustment	(g/kg)	Chronic	Chronic TRV (g/kg)	Quotient	Quotient	Effect	Effect
Summer Dermal Absorption	ption														
South Nest		1.0E-03	2.8E-01	6.9E-07	2	216			90.0	9	6.8E-01	1.6E-02	1.0E-06	i	2
Mid Nest		5.0E-04	2.8E-01	3.5E-07	2	216	32	320	0.06	6	6.8E-01	8.0E-03	5.1E-07	:	2
North Nest	t 45057	2.0E-04	2.8E-01	1.4E-07	2	216		320	90.0	6.	6.8E-01	3.2E-03		2	No
*Acute critical effects is slight to moderate skin irritation. Critical Study: Palmer 1990	slight to mode	erate skin irritation.	Critical Study:	Palmer 1990											
**Chronic critical effects are well defined enythema and edema. Critical Study: Lewis 1989	s are well defir	ned enythema and 6	edema. Critical	Study: Lewis 1989											
										-					· · · · · · · · · · · · · · · · · · ·

Bald eagle risk characterization for fog oil exposure under Pasquill Category E.

Victor Protection Control	Static Smoke	_	_	_		_										
Chicae Black Chic		Distance	Daily Acute I	ntake Value	Daily Chronic Intake Value (c/kg-		"Chronic Toxicity Value	Acute TRV Uncertainty	Chronic TRV Uncertainty	Acute TRV	Chronic	Chronic Dose Adjusted TRV	Acute Hazard	Chronic Hazard	Acute	Chronic
1,6,5,0 1,6,		(E)	u/b)	n³)	day)		(g/m³)	Adjustment	Adjustment		TRV (g/m³)	(g/kg-day)	Quotient	Quotient	Effect	Effect
1,6,0,0 6,0 0.1 22 220 1.88 31,6,04 41,6,04 27,6,03 18,6,05 18,0 18,6,04																
156-05 160 10 22 220 188 31E-04 41E-04 27E-04 18E-04 18E-05 18E-04 18E-05 18E-04	Winter Inhalation	-							!				Ì			
The Chical Study Chronic Acute TRV The Chical Study Chronic Risk The Chical Study Chroni		4000		-02	1.5E-06		0.1	32	320	1.88	3.1E-04	4.1E-04			2	ž
2 2 2 2 2 2 2 2 2 2		2000		-03	7.4E-07		0.1	32	320	1.88	3.1E-04	4.1E-04			2	ž
1,5 E-09 0.0 0.1 3.2 3.0 0.1 3.1 E-04 4.1 E-04 5.5 E-04 3.6 E-04 No. 1.5 E-08 0.0 0.1 3.2 3.0 0.1 3.1 E-04 4.1 E-04 2.7 E-04 No. 1.5 E-08 No. 1.5 E-08 0.0 0.1 3.2 3.0 3.1 E-04 4.1 E-04 2.7 E-05 No. 1.5 E-08 No. 1.5 E-08 No. 1.5 E-08 1.5 E-04 1.1 E-04 2.7 E-05 No. 1.5 E-04 1.1 E-04 2.7 E-05 No. 1.5 E-05 No. 1.5 E-04 1.1 E-04 2.7 E-05 No. 1.5 E		0006		-03	2.9E-07		Ö	32	320	1.88	3.1E-04	4.1E-04			S.	ž
74E-06 60 0 32 320 188 31E-04 41E-04 11E-04 10 10 10 10 10 10 10		14000		-03	1.5E-07		0.1	32	320	1.88	3.1E-04	4.1E-04			ટ	ž
1,5E-06 60 0 0 0 0 0 0 0 0		24000		94	7.4E-08		0.1	32	320	1.88	3.1E-04	4.1E-04	L		2	ž
1,5E-09 60 0 1 1 1 1 1 1 1 1		50000		-04	2.9E-08		0.1	32	320	188	3.1E-04	4.1E-04			2	ž
Daily Chronic Index Value for et at 1992 "Chronic Mark Value (pkg) Acute Toxicity Value (pkg) <td></td> <td>50000+</td> <td></td> <td>2</td> <td>1.5E-08</td> <td></td> <td>0</td> <td>32</td> <td>320</td> <td>188</td> <td>3.1E-04</td> <td>4.1E-04</td> <td>L</td> <td></td> <td>2</td> <td>2</td>		50000+		2	1.5E-08		0	32	320	188	3.1E-04	4.1E-04	L		2	2
Chical Study, Diver et al. 1992 Chronic Brand, Diversiting Chronic FRV Chronic		2000		5	20.70:1	3	i	5								
Daily Chronic Study. Driver et al. 1992 Acute foxicity Value (g/kg) "Chronic TRV Chronic TRV Chronic TRV (g/kg) Acute Acute (g/kg) Acute Troxicity Value (g/kg) "Chronic TRV (g/kg) Acute Acute (g/kg) Acute (g/kg)	*Acute critical effect is	oil pneumonia.		Shinn et al. 1987												
Daily Chronic Daily Chroni	"Chronic critical effec	as are minor les	sions of the heart,	liver and lungs.	Critical Study: Driver	et al. 1992										
Daily Acute Intake Value (g/kg) Tile Order (recta serve weight) Acute Toxicity Value (g/kg) Adjustment Adjustment Adjustment (g/kg) Chronic TRV (g																
Total Daily Acasta Intake Value (pkg) Second Seco		Control			Daily Chronic		**Chronic	Acute TRV	Chronic TRV	Acute			Acute	Chronic	Acute	Chronic
11 11 11 11 11 11 11 1		E)	Daily Acute Inta	ke Value (g/kg)	day)		(g/kg)	Adjustment	Adjustment	(g/kg)	Chroni	c TRV (g/kg)	Quotient	Quotient	Effect	Effect
11000 11E-03 56E-04 176 22 32 3200 0.5500 6.5E-03 19E-03 19E-03 No																
She-5d 176 22 32 3200 0.5500 6.9E-03 9.7E-02 No 1.1E-04 176 22 32 3200 0.5500 6.9E-03 9.7E-02 No 5.7E-05 176 22 32 3200 0.5500 6.9E-03 9.7E-02 No 2.9E-05 176 22 32 3200 0.5500 6.9E-03 9.7E-04 4.7E-02 No 2.9E-05 176 22 32 3200 0.5500 6.9E-03 9.7E-04 4.7E-02 No 2.9E-06 176 22 32 3200 0.5500 6.9E-03 9.7E-04 4.7E-02 No 5.NE-06 176 22 32 3200 0.5500 6.9E-03 9.7E-04 4.7E-02 No 5.NE-06 176 22 32 3200 0.5500 6.9E-03 9.7E-04 A.7E-02 No 6.NE-07 1.NE-08 1.NE-08 1.0E-03 1.0E-03 1.7E-0	Winter Ingestion							100	0000	0000		20.10	00 10 7			
2 BE-04 17 SIGN 22 32 3200 0.5500 6.9E-03 3.9E-04 4.7E-02 NO 5.7E-05 17 E-05 17 E-05 17 E-05 17 E-05 17 E-02 NO 5.7E-05 17 E-05 17 E-05 17 E-05 17 E-05 17 E-05 17 E-05 17 E-05 17 E-05 17 E-05 17 E-05 17 E-05 17 E-05 17 E-05 17 E-05 17 E-05 17 E-05 17 E-05 NO 17 E-05 17 E-05 17 E-05 17 E-05 17 E-05 NO 17 E-05 17 E-05 17 E-05 NO 17 E-05 <td< td=""><td></td><td>į</td><td></td><td>-03</td><td>5.6E-04</td><td></td><td></td><td>35</td><td>3200</td><td>0.5500</td><td></td><td>9E-03</td><td>1.85-03</td><td></td><td>2</td><td>Ž ! 3</td></td<>		į		-03	5.6E-04			35	3200	0.5500		9E-03	1.85-03		2	Ž ! 3
11E-04 17 th		10000		4	2.8E-04			32	3200	0.5500		.9E-03	9.7E-04		2	2 2
S/F-05 17.6 22 32 3200 0.5500 6.9E-03 1.9E-04 8.3E-04 No 1.E-05 17.6 22 32 3200 0.5500 6.9E-03 9.7E-05 1.7E-03 No 5.6E-05 17.6 22 32 3200 0.5500 6.9E-03 3.9E-05 1.7E-03 No Critical Study. Bramachari 1958 **Chronic Acute Toxicity Value Acute Toxicity Value Uncertainty Uncertainty Once		00081		-04	1.15-04			35	3200	0.5500		385-03	3.30-04	-	2	2
2 SEC-05 17 G 22 32 3200 0.5500 6.8E-03 9.7E-05 1.7E-03 No 5 (SE-05) 17 G 22 32 3200 0.5500 6.9E-03 3.9E-05 1.7E-03 No Critical Study. Bramachari 1958 "Chronic Acute Toxicity Toxicity Value Uncertainty Uncertainty Uncertainty Uncertainty Uncertainty Uncertainty TRV Acute Toxicity		30000		2	5.7E-05			32	3200	0.5500		. 9E-03	1.9E-04		2	Ž
1.1E-05 17.6 22 32 3200 0.5500 6.9E-03 3.9E-05 1.7E-03 No Sie Eoc Trice Study. Bramachari 1956 32 3200 0.5500 6.9E-03 1.9E-05 8.4E-04 No Critical Study. Bramachari 1956		20000		-05	2.9E-05			32	3200	0.5500		. 9E-03	9.7E-05	ļ	2	ž
SEE-OF 17.6 22 320 0.5500 6.9E-03 1.9E-05 8.4E-04 No Critical Study Branacharl 1958 **Chronic Acute TRV Chronic TRV Acute TRV Chronic TRV Acute TRV Chronic TRV Acute TRV Chronic TRV Acute TRV Chronic TRV Acute TRV Chronic TRV Acute TRV Chronic TRV Acute TRV Chronic TRV Acute TRV Chronic TRV Acute TRV Chronic TRV Acute TRV Chronic TRV Acute TRV<		20000+	1	-05	1.1E-05		4	32	3200	0.5500		.9E-03	3.9E-05	1	2:	ž,
Critical Study. Bramachari 1958 Critical Study. Bramachari 1958 Critical Study. Bramachari 1958 Critical Study. Bramachari 1958 Critical Study. Bramachari 1958 Critical Study. Branchari	THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN	\$0000+		:-05	5.8E-06			32	3200	0.5500		: 9E-03	1.9E-05		2	ž
Chrical Study: Bramacharl 1958 Chronic TRV Acute Chronic TRV Acute Chronic TRV Chronic									-							
Chronic Acute Toxicity Coxicity Value Chronic TRV	*Acute critical effects	are weight loss	and lesions of the	eliver, splen, and	kidney. Critical Study	:-!	8			1					-	
Distance Intake Value Skin Surface Demaily absorbed Acute Toxicity Value Intake Value Skin Surface Demaily absorbed Acute Toxicity Value Intake Value Skin Surface Demaily absorbed Acute Toxicity Value Intake Value In	**Chronic critical effer	t is gastrointes	tinal irritation. Crit	tical Study: Lew	is 1989											According to the contract of
Table Parison Table Pariso		-	Daily Acute				-11-000	1100	10					10		
High Character		Dietance	Intake Value	Skin Surface			Toxicity Value	Incertainty	Uncertainty	TRV			Hazard	Hazard	Acute	Chronic
7500 1.0E-02 2.8E-01 4.9E-06 2 216 32 320 0.0625 6.8E-01 7.3E-06 10000 5.0E-03 2.8E-01 2.5E-06 2 216 32 320 0.0625 6.8E-01 7.3E-05 10000 5.0E-03 2.8E-01 9.9E-07 2 216 32 320 0.0625 6.8E-01 3.2E-02 3.7E-02 30000 2.0E-03 2.8E-01 4.9E-07 2 216 32 320 0.0625 6.8E-01 3.2E-02 3.7E-		(E)	(g/m²)	Area (m²)			(g/kg)	Adjustment	Adjustment	(g/kg)	Chroni	ic TRV (g/kg)	Quotient	Quotient	Effect	Effect
7500 1.0E-02 2.8E-01 4.9E-06 2 216 32 320 0.0625 6.8E-01 7.3E-06 10000 5.0E-03 2.8E-01 2.5E-06 2 216 32 320 0.0625 6.8E-01 7.3E-02 3.7E-02 18000 2.0E-03 2.8E-01 9.9E-07 2 216 32 320 0.0625 6.8E-01 3.7E-02 3.7E-02 30000 1.0E-03 2.8E-01 4.9E-07 2 216 32 320 0.0625 6.8E-01 1.5E-02 1.5E-06 50000 5.0E-04 2.8E-01 4.9E-07 2 2.16 32 320 0.0625 6.8E-01 1.5E-02 1.5E-07 50000 5.0E-04 2.8E-01 4.9E-07 2.5E-07 2.16 32 320 0.0625 6.8E-01 1.5E-07 3.7E-02 1.5E-07 50000+ 5.0E-04 2.8E-01 4.9E-08 2 2.16 32 320 0.0625 6.8E-01 3.7E		L														
5 2 216 32 320 0.0625 6.8E-01 1.6E-01 7.3E-06 7 2 2.16 32 320 0.0625 6.8E-01 8.0E-02 3.7E-06 7 2 2.16 32 320 0.0625 6.8E-01 1.6E-02 7.3E-07 7 2 2.16 32 320 0.0625 6.8E-01 1.6E-02 7.3E-07 8 2 2.16 32 320 0.0625 6.8E-01 8.0E-03 3.7E-02 8 2 2.16 32 320 0.0625 6.8E-01 8.0E-03 3.7E-02 8 2 2.16 32 3.00 3.00 6.8E-01 8.0E-03 3.7E-02 9 2 2.16 32 3.00 0.0625 6.8E-01 1.6E-03 7.3E-08 9 2 2.16 32 3.00 3.00 6.8E-01 1.6E-03 7.3E-08	Winter Dermal Absor,	_								and the second of the second					i	
5 2 216 32 320 0.0625 6.8E-01 8.0E-02 3.7E-06 7 2 216 32 320 0.0625 6.8E-01 3.5E-02 7.3E-07 7 2 2.16 32 320 0.0625 6.8E-01 1.6E-02 7.3E-07 8 2 2.16 32 320 0.0625 6.8E-01 8.0E-03 3.7E-07 8 2 2.16 32 320 0.0625 6.8E-01 8.0E-03 3.7E-07 8 2 2.16 32 320 0.0625 6.8E-01 1.6E-03 7.3E-07 8 2 2.16 32 320 0.0625 6.8E-01 1.6E-03 7.3E-07		7500			4.9E-06			32	320	0.0625		5.8E-01	1.6E-01			Ž
7 2 216 32 320 0.0625 6.8E-01 3.2E-02 1.5E-06 7 2 2.16 32 320 0.0625 6.8E-01 1.6E-02 7.3E-07 8 2 2.16 32 320 0.0625 6.8E-01 8.0E-33 3.7E-07 8 2 2.16 32 320 0.0625 6.8E-01 3.2E-03 1.5E-07 8 2 2.16 32 320 0.0625 6.8E-01 1.6E-07 7.3E-08 8 2 2.16 32 320 0.0625 6.8E-01 1.6E-07 7.3E-08		10000			2.5E-06				320	0.0625	***************************************	3.8E-01	8.0E-02			Ž
7 2 216 32 320 0.0625 6.8E-01 1.6E-02 7.3E-07 7.8E-07 2 216 32 320 0.0625 6.8E-01 8.0E-03 7.3E-07 2 216 32 320 0.0625 6.8E-01 3.2E-03 7.3E-08 2 216 32 320 0.0625 6.8E-01 1.6E-07 7.3E-08 2 216 32 320 0.0625 6.8E-01 1.6E-03 7.3E-08 2 216 32 320 0.0625 6.8E-01 1.6E-03 7.3E-08 2 216 32 320 0.0625 6.8E-01 1.6E-03 7.3E-08 2 216 32 320 0.0625 6.8E-01 1.6E-03 7.3E-08 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		18000			9.9E-07				320	0.0625		3.8E-01	3.2E-02			Ž
7 2 216 32 320 0.0625 6.8E-01 8.0E-03 3.7E-07 8 2 216 32 320 0.0625 6.8E-01 3.2E-03 7.5E-07 9 2 216 32 320 0.0625 6.8E-01 1.6E-03 7.3E-08 1 1 1 1 1 1 1 1		30000							320	0.0625		3.8E-01	1.6E-02			Ž
8 2 216 32 320 0.0625 6.8E-01 3.2E-03 7.5E-07		20000							320	0.0625		3.8E-01	8.0E-03			Ž
8 2 216 32 320 0.0625 6.8E-01 1.6E-03 7.3E-08		£0000+						32	320	0.0625		3.8E-01	3.2E-03		2	Ž
*Acute critical effect is slight to moderate skin irritation. Critical Study. Palmer 1990 **Chronic critical effects are well defined erythema and edema. Critical Study. Lewis 1989		\$0000++						32	320	0.0625		3.8E-01	1.6E-03	-	S	2
*Acute critical effect is slight to moderate skin tririation. Critical Study. Palmer 1990 *Chronic critical effects are well defined enythema and edema. Critical Study. Lewis 1989																
**Chronic critical effects are well defined enythema and edema. Critical Sludy. Lewis 1989	*Acute critical effect i	s slight to mode	srate skin irritation.	Critical Study:	Palmer 1990					-						i
	-Chronic critical effe.	cts are well defa	ined enythema and	dedema. Critica	Study: Lewis 1989	_					_					

Bald eagle risk characterization for fog oil exposure under Pasquill Category E.

	Distance (m)	Daily Acute Intake Value (g/m³)		Daily Chronic Intake Value (g/kg-day)	*Acute Toxicity Value (g/m³)	**Chronic Toxicity Value (g/m³)	Acute TRV Uncertainty Adjustment	Chronic TRV Uncertainty Adjustment	Acute TRV (g/m³)	Chronic TRV (g/m³)	Chronic Dose Adjusted TRV (g/kg-day)	Acute Hazard Quotient	Chronic Hazard Quotient	Acute Effect	Chronic Effect
Summer Inhalation															
South Nest	1 20229	5.0E-04	4	1.0E-07	8	0.1	32	320	1.88	3.1E-04	4.1E-04			Š	ટ
Mid Nest	Ĺ	5.0E-04	40	1.0E-07	9	0.1	32	320	1.88	3.1E-04	,			운	2
North Nest	45057	2.0E-04	40	4.15-08	09	0.1	32	320	1.88	3.1E-04	4.1E-04	1.16.04	1.0E-04	2	2
'Acute critical effect is oil pneumonia. Critical Study: Shinn et al. 1997	oil pneumonia.	Critical Study: St	hinn et al. 1987	. [:			:	ļ	} .				:	
**Chronic critical effects are minor lesions of the heart, Iwer and lungs. Critical Study: Driver	s are minor les	sions of the heart,	iver and lungs.	Critical Study: Driver	et al. 1992										
	Distance	Daily Acute Intake Value	Skin Surface	Skin Surface Dermally absorbed	*Acute Toxicity	**Chronic Toxicity Value	Acute TRV	Chronic TRV Uncertainty	Acute			Acute Hazard	Chronic Hazard	Acute	Chronic
	(m)	(g/m²)	Area (m²)	dose (g/kg-day)		(g/kg)	Adjustment	Adjustment	(g/kg)	Chroni	Chronic TRV (g/kg)	Quotient	Quotient	Effect	Effect
Summer Dermal Absorption	rption														-
South Nest		1.0E-03	2.8E-01	6.9E-07	2	216		320	90.0	Ψ	6.8E-01	1.6E-02	Ì	2	ĝ
Mid Nest	23638	1.0E-03	2.8E-01	6.9E-07	2	216	32	320	90.0	Ψ	6.8E-01	1.6E-02		Š	Š
North Nest	45057	5.0E-04	2.8E-01	3.5E-07	2	216	32	320	90.0	J	6.8E-01	8.0E-03	5.1E-07	운	2
*Acute critical effect is slight to moderate skin irritation. Critical Study: Palmer 1990	slight to mode.	rate skin irritation.	Critical Study:	Palmer 1990											
**Chronic critical effects are well defined erythema and edema. Critical Study: Lewis 1989	ts are well defin	ned enythema and	edema. Critical	Study: Lewis 1989											

Attachment H: Fog Oil - Mobile Smoke

Bald eagle risk characterization for fog oil exposure under Pasquill Category E.

Digital Control Digital Co		Distance				*Amite Taylolla	- chrome	Acute IRV	Chronic I KV	TR >	Chronle	Adjusted TRV	Hazard	Hazard	Acute	Chronic
1,15,50 1,15					Dally Chronic Intake	Acute content	DAIGHY VALUE	Circulation of the circulation o	Uncertainty	_	J. 17. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.	(miles day)	- surgistic	- de altono	Effect	Effect
186-07 100 10 10 10 10 10 10		Œ)	Daily Acute Intake	Value (g/m²)	Value (g/kg-day)	Value (g/m²)	(a/6)	Adjustment	Adjustment		IKV (g/m.)	(g/kg-day)	TOO TO	Welloop	1700113	
1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,	Summer Inhalation															
1,0,0,0 1,0,0 1,0,0 1,	Ausgrave Hollow															
1,26,07 60 0.1 32 320 1,88 3,16,04 4,16,04 1,16,04 3,66,04 10 10 1,16,04 1,16,	South Nest	25174	2.0E-04	_	2.5E-07	8	0.1		320	1.88	3.1E-04	4. 1E-04				Ž
1,12,6,7 60 0.1 3.2 3.20 1.88 3.15,04 4.15,04 1	Mid Nest	27956	2.0E-04	7	2.5E-07	9	0.1		320	1.88	3.16-04	4.1E-04				Ž
118E-07 600 011 32 320 118 31E-04 41E-04 11E-04 45E-04 100 118E-07 600 011 32 320 118 31E-04 41E-04 41E-04 32E-04 100 118E-07 600 011 32 320 118 31E-04 41E-04 41E-04 32E-04 100 118E-07 600 011 32 320 118 31E-04 41E-04 32E-04 100 118E-07 600 011 32 320 118 31E-04 41E-04 32E-04 100 118E-07 600 011 32 320 118 31E-04 41E-04 32E-04 100 118E-07 600 011 32 320 118 31E-04 41E-04 32E-04 100 118E-07 600 011 32 320 118 31E-04 41E-04 32E-04 100 118E-07 600 011 32 320 118 31E-04 41E-04 32E-04 100 118E-07 600 011 32 320 118 31E-04 41E-04 32E-04 100 118E-07 600 011 32 320 118 31E-04 41E-04 32E-04 100 118E-07 600 011 32 320 118 31E-04 41E-04 32E-04 100 118E-07 600 011 32 320 118 31E-04 41E-04 32E-04 100 118E-07 600 011 32 320 118 31E-04 41E-04 32E-04 100 118E-07 600 011 600 600 600 118E-07 600 600 600 600 118E-07 600 600 600 600 118E-07 600 600 600 600 118E-07 600 600 600 600 118E-07 600 600 600 600 118E-07 600 600 600 118E-07 600 600 600 118E-07 600 600 600 118E-07 600 600 600 118E-07 600 600 600 118E-07 600 600 600 118E-07 600 600 600 118E-07 600 600 118E-07 600 600 118E-07 600 600 118E-07 600 600 118E-07 600 600 118E-07 600 600 118E-07 600 600 118E-07 600 600 118E-07 600 600 118E-07 600 600 118E-07 600 600 118E-07 600 600 118E-07 600 600 118E-07 600 600 118E-07 600 600 118E-07 600 600 118E-07 600 600 118E-07 600 118E-07 600 600 118E-07 600 118E-07 600 118E-07 600 118E-07 600 118E-07 600 118E-07	North Nest	48211	1.05-04	4	1.2E-07	9	0.1		320	1.88	3.15-04	4.1E-04				Ž
18E-07 60 0 3 3 3 3 5 4 4 15 4	Sally McCann Hollow															
186-07 186-07 10 32 320 188 316-04 416-04 116-04 376-04 No No 116-04 116-0	South Nest	19717	2.0E-04	4	1.8E-07	9	0.1		320		3.1E-04	4.15.04				Ž
15E-07 15E-07 10 1 1 1 1 1 1 1 1	Mid Nest	23623	2.0E-04	4	1.8E-07	99	0.1		320		3.1E-04	4.1E-04				ž
15E-07 60 0.1 22 220 148 3.1E-04 4.1E-04 1.1E-04 3.7E-04 No 3.7E-04 No	North Nest	44956	1.0E-04	4	9.2E-08	9	0.1		320		3.1E-04	4,1E-04			Š	ž
1,15E-07 10 10 10 10 10 10 10	Uneh Paddle Hollow															
1.5E-07 1.5E	South Nest	20749	2.0E-04	4	1.5E-07	8	0.1		320		3.1E-04	4.1E-04				ž
1,12E-07 1,12E-07 1,12E-07 1,12E-07 1,12E-04	Mid Nest	28050	2.0E-04	4	1.5E-07	8	0.1		320		3.1E-04					ž
176E-07 100 11 11 11 11 11 11	North Nest	49712	1.0E-0.	4	7.7E-08	9	0.1		320		3.1E-04					ž
Circle Study: Driver et al. 1992 Circle Study: Driver et al. 1993 Circle Study: Driver et al. 1993 Circle Study: Driver et al. 1993 Circle Study: Driver et al. 1993 Circle Study: Driver et al. 1993 Circle Study: Driver et al. 1993 Circle Study: Driver et al. 1993 Circle Study:	Sallard Hollow															
Circle Study; Driver et al. 1992 Circle Study; Driver et al. 1992 Circle Study; Driver et al. 1992 Circle Study; Driver et al. 1992 Circle	South Nest	17463	2.0E-04	,	1.2E-07	8	0.1				3.16-04					ž
Circles Study; Driver at al. 1992 Circles Study; Driver at al.	Mid Nest	11677	5.0E-0.	4	3.15-07	8	0.1				3.15-04	4.1E-04				ž
Critical Study: Driver et al. 1992 **Chronic PRV Chronic TRV Adute Adute Toxicity Adute Toxicity Chronic TRV Adute Toxicity Adu	North Nest	L	1.0E-0	4	6.1E-08	3	0.1				3.1E-04	4.1E-04				ž
Critical Study, Driver et al. 1992 Chronic TRV Chron																
Circlest Study: Driver et al. 1992 Parametric Mainternant Adjustment Adju	Acute critical effect is of	pneumonia.	Critical Study: Shinn	n et al. 1987												
Dermally absorbed Acute Toxicity Value Acute Value Acute	Chronic critical effects	are minor lesio	ins of the heart liver	and lunds Crit	Ical Study: Driver et al	1 1992										
Daily Native Daily Native Daily Native Daily Native Daily Native Daily Native Daily Native Daily Native Daily Native Daily Native Daily Native Daily Native Daily Native Daily Native																
				200			Chronic	Acute TRV	Chronic TRV	Acute			Acute	Chronic	Acute	Chronic
21514 10E-03 28E-01 34E-06 2 216 32 320 0.06 6.8E-01 16E-02 NO 1.8E-06 NO 1.8E-07 1.6E-03 3.7E-08 NO 1.8E-07 1.6E-03 3.7E-08 NO 1.8E-07 1.6E-03 3.7E-08 NO 1.8E-07 1.6E-03 3.7E-08 NO 1.8E-07 1.6E-03 2.8E-01 2.8E-01	-	Distance (m)		irea (m²)	dose (g/kg-day)	Value (g/kg)	(g/kg)	Adjustment	Adjustment	(g/kg)	Chro	ic TRV (g/kg)	Quotient	Quotient	Effect	Effect
25/14 1.0E-03 2.8E-01 3.4E-06 2 216 32 320 0.06 6.8E-01 1.6E-02 5.1E-06 No 42211 1.0E-03 2.8E-01 1.2E-06 2 2.16 3.2 3.20 0.06 6.8E-01 1.6E-02 3.7E-06 No 42211 5.0E-04 2.8E-01 1.2E-06 2 2.16 3.2 3.20 0.06 6.8E-01 1.6E-02 3.7E-06 No 18717 1.0E-03 2.8E-01 1.9E-06 2 2.16 3.2 3.20 0.06 6.8E-01 1.6E-02 2.7E-06 No 2865 4.0E-04 1.9E-06 2 2.16 3.2 3.20 0.06 6.8E-01 1.6E-02 2.7E-06 No 28050 2.0E-03 2.8E-01 1.4E-07 2 2.16 3.2 3.20 0.06 6.8E-01 1.6E-02 2.7E-06 No 28050 2.0E-03 2.8E-01 1.7E-07 2 2.16 3.2 </td <td></td> <td></td> <td>Γ</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>			Γ													
25714 1,0E-03 2,8E-01 3,4E-06 2 216 32 320 0,06 6,8E-01 1,6E-02 5,1E-06 No 42211 5,0E-04 2,8E-01 1,2E-06 2 216 32 320 0,06 6,8E-01 1,6E-02 3,7E-06 No 42211 5,0E-04 2,8E-01 1,2E-06 2 216 32 320 0,06 6,8E-01 1,6E-02 3,7E-06 No 19717 1,0E-03 2,8E-01 1,9E-06 2 216 32 320 0,06 6,8E-01 1,6E-02 2,7E-06 No 23623 1,0E-03 2,8E-01 7,4E-07 2 216 32 320 0,06 6,8E-01 1,6E-02 2,7E-06 No 23749 1,0E-03 2,8E-01 7,4E-07 2 216 32 320 0,06 6,8E-01 1,6E-02 2,7E-06 No 23749 1,0E-03 2,8E-01 7,7E-07 2 2,6	ummer Dermal Absorp	noi														
10 10 10 10 10 10 10 10	lusgrave Hollow													ı		
18F 05 1.0E-03 2.8E-01 1.0E-03 3.7E-06 0.06 6.8E-01 1.0E-02 3.7E-06 No 18F 17 1.0E-03 2.8E-01 1.2E-06 2.7E-06 No 1.0E-03 2.7E-06 No 18F 27 1.0E-03 2.8E-01 1.9E-06 2.7E-06 No 6.8E-01 1.6E-02 2.7E-06 No 18F 26 1.0E-03 2.8E-01 1.9E-06 2.7E-06 No 6.8E-01 1.6E-02 2.7E-06 No 18F 26 1.0E-03 2.8E-01 1.9E-06 2.7E-07 2.7E-07 2.7E-07 2.7E-07 2.7E-07 2.7E-07 2.7E-07 2.7E-07 2.7E-07 2.7E-07 2.7E-07 2.7E-07 2.7E-07 2.7E-07 2.7E-07 2.7E-07 2.7E-06 No 18F 201-0 1.0E-03 2.8E-01 1.5E-06 2.2E-01 2.7E-06 No 2.7E-07 2.7E-06 No 18F 201-0 1.0E-03 2.8E-01 2.8E-01 2.2E-01 2.2E-01 2.2E-01 2.2E-02	South Nest		1.0E-03	2.8E-01	3.4E-06	2	216					6.8E-01	1.6E-02			Ž
48 (25.1) 5,0E-04 2,8E-01 1,2E-06 2 216 32 320 0.06 6,8E-01 1,6E-02 2,7E-06 No 18 (37.7) 1,0E-03 2,8E-01 1,9E-06 2 216 32 320 0.06 6,8E-01 1,6E-02 2,7E-06 No 18 (37.7) 1,0E-03 2,8E-01 1,9E-06 2 216 32 320 0.06 6,8E-01 1,6E-02 2,7E-06 No 18 (49.56) 4,0E-04 2,8E-01 1,5E-06 2 2.16 32 320 0.06 6,8E-01 1,6E-06 No 18 (27.49) 1,0E-03 2,8E-01 1,7E-07 2 2.16 32 320 0.06 6,8E-01 1,6E-06 No 18 (27.49) 1,0E-03 2,8E-01 3,7E-07 2 2,16 32 320 0.06 6,8E-01 1,6E-06 No 18 (27.42) 2,0E-03 2,8E-01 2,7E-07 2 2,16 32 320	Mid Nest		1.0E-03	2.8E-01	2.5E-06	2	216					6.8E-01	1.6E-02			Ž
1917 1.0E-03 2.8E-01 1.9E-06 2 2.16 3.2 3.20 0.06 6.8E-01 1.6E-02 2.7E-06 No 181 2.36.23 1.0E-03 2.8E-01 1.9E-06 2 2.16 3.2 3.20 0.06 6.8E-01 1.6E-02 2.7E-06 No 181 2.36.23 1.0E-03 2.8E-01 7.4E-07 2 2.16 3.2 3.20 0.06 6.8E-01 1.6E-02 2.7E-06 No 181 4.4356 4.0E-04 2.8E-01 7.7E-07 2 2.16 3.2 3.20 0.06 6.8E-01 1.6E-02 2.7E-06 No 181 2.0A-03 2.8E-01 7.7E-07 2 2.16 3.2 3.20 0.06 6.8E-01 6.6E-01 No 181 1.0A-03 2.8E-01 7.7E-07 2 2.16 3.2 3.20 0.06 6.8E-01 8.6E-01 No 182 1.0A-03 2.8E-01 2.8E-01 2.7E-0	North Nest	48211	5.0E-04	2.8E-01	1.2E-06	2	216					6.8E-01	8.0E-03			Ž
15E 15E 15E 15E 25 216 32 320 0.06 6.8E 1.6E 2.7E No 15E 15E 15E 15E 25 216 32 320 0.06 6.8E 1.1E No 15E 15E 15E 25E 216 32 320 0.06 6.8E 1.1E No 15E 15E 25E 216 32 320 0.06 6.8E 1.1E No 15E 25E 31E 25E 216 32 320 0.06 6.8E 1.1E No 15E 25E 31E 25E 216 32 320 0.06 6.8E 1.1E No 15E 25E 31E 32 320 0.06 6.8E 1.1E No No 15E 32 320 0.06 6.8E 0.06 0.6E 0.6E No 0.6E No	Sally McCann Hollow			-												
est 23623 1 0E-03 2 8E-01 1 9E-06 2 16E-02 2 1	South Nest	19717	1.0E-03	2.8E-01	1.95-06	2						6.8E-01	1.6E-02	Ì	Ì	Ž
641 41956 4.0E-04 2.8E-01 7.4E-07 2 216 32 320 0.06 6.8E-01 1.6E-02 2.3E-06 No 641 32 326 320 0.06 6.8E-01 1.6E-02 2.3E-06 No 641 32 326 320 0.06 6.8E-01 3.2E-02 4.6E-06 No 641 32 3.60 0.06 6.8E-01 3.2E-02 1.1E-06 No 641 49712 5.0E-04 2.8E-01 7.7E-07 2 2.16 32 320 0.06 6.8E-01 8.0E-03 1.1E-06 No 641 1.675 2.6E-04 2.7E-06 2 2.16 32 320 0.06 6.8E-01 8.0E-03 3.7E-06 No 641 1.677 2.6E-03 2.6E-04 2.5E-06 2 2.16 32 320 0.06 6.8E-01 8.0E-03 3.7E-02 3.7E-02 3.7E-02 3.7E-02 3.7E-02 3.7	AND Nest	23623	1.0E-03	2.8E-01	1.95-06	2						6.8E-01	1.6E-02			Ž
est 20749 1.0E-03 2.8E-01 1.5E-06 2 2:6 3.2 3.2 0.06 6.8E-01 1.6E-02 2.3E-02 No est 20049 2.0E-03 2.8E-01 3.1E-06 2 2.1E-06 3.2 3.2 3.0 0.06 6.8E-01 3.2E-02 4.6E-06 No est 1.0E-03 2.8E-01 7.7E-07 2 2.16 3.2 3.0 0.06 6.8E-01 8.0E-03 1.1E-06 No est 1.1677 2.8E-01 2.2E-06 2 2.16 3.2 3.0 0.06 6.8E-01 3.2E-02 3.7E-06 No est 1.677 2.0E-03 2.8E-01 2.2E-06 2.2E-06 2.2E-06 3.2E-07 No 8.0E-01 3.2E-02 3.7E-06 No est 1.677 2.0E-03 2.8E-01 2.2E-06 2.2E-06 3.2E-07 No 8.0E-01 8.0E-03 3.2E-07 No a sight to moderate skin intration. Critical Study: Lewis 1989 </td <td>North Nest</td> <td>44956</td> <td>4.0E-04</td> <td>2.8E-01</td> <td>7.4E-07</td> <td>2</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>6.8E-01</td> <td>6.4E-03</td> <td></td> <td></td> <td>Ž</td>	North Nest	44956	4.0E-04	2.8E-01	7.4E-07	2						6.8E-01	6.4E-03			Ž
est 20749 1.0E-03 2.8E-01 1.5E-06 2.3E-01 1.6E-02 2.3E-09 No est 20550 2.0E-03 2.8E-01 3.1E-06 2 2.1E 3.2 3.0 0.06 6.8E-01 3.2E-02 4.6E-08 No est 49712 5.0E-04 2.8E-01 7.7E-07 2 2.1E 3.2 3.0 0.06 6.8E-01 3.2E-02 3.7E-02 No est 11743 2.0E-03 2.8E-01 2.5E-06 2 2.1E 3.2 3.0 0.06 6.8E-01 3.2E-02 3.7E-02 No est 11677 2.0E-03 2.8E-01 2.5E-06 2 2.1E 3.2 3.0 0.06 6.8E-01 3.2E-02 3.7E-02 No est 11677 2.0E-03 2.8E-01 2.5E-06 2 2.1E 3.2 3.0 0.06 6.8E-01 3.2E-07 No est 3.4057 5.0E-04 2.8E-01 2.8E-01 2.8E-	Jush Paddle Hollow															
E-06 2 216 32 320 0.06 6.8E-01 3.2E-02 4.6E-06 No E-07 2 216 32 320 0.06 6.8E-01 3.2E-02 3.7E-06 No E-06 2 216 32 320 0.06 6.8E-01 3.2E-02 3.7E-06 No E-07 2 216 32 320 0.06 6.8E-01 3.2E-02 3.7E-06 No E-07 2 216 32 320 0.06 6.8E-01 3.2E-02 3.7E-06 No	South Nest	20749	1.0E-03	2.8E-01	1.5E-06							6.8E-01	1.6E-02		l	Ž
E-07 2 216 32 320 0.06 6.8E-01 8.0E-02 1.1E-06 No E-06 2 216 32 320 0.06 6.8E-01 3.2E-02 3.7E-06 No E-07 2 216 32 320 0.06 6.8E-01 3.2E-02 3.7E-06 No E-07 2 216 32 320 0.06 6.8E-01 8.0E-02 3.7E-07 No	Mid Nest	L	2.0E-03	2.8E-01	3.15-06	2						6.8E-01	3.2E-02			Ž
E-06 2 216 32 320 0.06 6.8E-01 3.2E-02 3.7E-02 No E-07 2 216 32 320 0.06 6.8E-01 3.2E-02 3.7E-06 No E-07 2 216 32 32 0.06 6.8E-01 8.0E-07 No	North Nest	L	5.0E-04	2.8E-01	7.7E-07	2						6.8E-01	8.0E-03			Ž
E-06 2 216 32 320 0.06 6.8E-01 3.2E-02 3.7E-06 No E-06 6.8E-01 3.2E-02 3.7E-06 No E-07 2 216 32 320 0.06 6.8E-01 8.0E-03 9.2E-07 No E-07 2 216 32 320 0.06 6.8E-01 8.0E-03 9.2E-07 No E-07 2 216 32 32 320 0.06 0.8E-01 8.0E-03 9.2E-07 No E-07 2 32 32 32 32 32 32 32 32 32 32 32 32 3	Sallard Hollow															1
E-06 2 216 32 320 0.06 6.BE-01 3.7E-02 3.7E-07 No E-07 6.BE-01 8.0E-03 9.2E-07 No E-07 8.0E-09 9.2E-07 No E-09 9.2E-07 No E-09	South Nest		2.0E-03	2.8E-01	2.5E-06							6.8E-01	3.25-02			2 2
E-07 2 216 32 320 0.06 6.8E-01 8.0E-03 9.2E-07 No	Mid Nest		2.0E-03	2.8E-01	2.5E-06							6.8E-01	3.2E-02			Ž į
Acute critical effect is slight to moderate skin irritation. Critical Study: Palmer 1990 "Chronic critical effects are well defined enythema and edema. Critical Study: Lewis 1989	North Nest	34057	5.0E-04	2.8E-01	6.2E-07							6.8E-01	8.0E-03	١		Ž
Acute critical effects are well defined enythema and edema. Critical Study: Lewis 1989 *Chronic critical effects are well defined enythema and edema. Critical Study: Lewis 1989																
*Chronic critical effects are well defined erythema and edema. Critical Study: Lewis 1989	Acute critical effect is su	ight to modera	ate skin irritation. Cri	fical Study: Pa	mer 1990											
	"Chronic critical effects	are well define	ed erythema and ede	ema, Critical Sti	udy: Lewis 1989											
													1			

Bald eagle risk characterization for fog oil exposure under Pasquill Category E.

Mobile Smoke				_	_	_								-	
						Chronic	Acute TRV	Chronic TRV	Acute	Ī	Chronic Dose	Acute	Chronic	T	
	(m)	Dally Acute Intake Value (g/m³)		Dally Chronic Intake Value (g/kg-day)	Value (g/m³)	Toxicity Value (g/m³)	Uncertainty	Uncertainty	1RV (a/m²)	Chronic TRV (a/m³)	Adjusted TRV (ofkg-dav)	Hazard	Hazard	Acute	Chronic
			-						T						
Winter Inhalation														1	
	3000		12	8.8E-08		0.1	32	320	1.88	3.1E-04	4.1E-04		2 4F-02	2	2
	400		23	4.4E-08	09	0.1	32	320	1.88	3.1E-04	4.1E-04	2.7E-03		2	2
	2007		33	1.8E-08		0.1	32	320	1.88	3.16-04	4.1E-04		4.3E-03	2	2
	10000		2	8.8E-07		0.1	32	320	1.88	3.1E-04	4.1E-04	5.3E-04		2	2
	16000		4	4.4E-07		0.1	32	320	1.88	3.15-04	4.15-04			2	2
	30000		4	1.8E-07	09	0.1	32	320	1.88	3.1E-04	4.1E-04			2	2
	20000	1.05-04	4	8.8E-08		0.1	32	320	1.88	3.1E-04	4.1E-04			2	2
												L			
*Acute critical effect is oil pneumonia. Critical Study: Shinn et al. 1987	pneumonia.	Critical Study: Shini	n et al. 1987											1	
"Chronic critical effects are minor lesions of the heart, liver and lungs. Critical Study: Driver	are minor tesk	ons of the heart, liver	and lungs. Crit		et al. 1992										
	2000					"Chronic	Acute TRV	Chronic TRV	Acute			Acute	Chronic		T
		Polls: Acres Indeter		Daily Chronic Intake	Acute Toxicity	Toxicity Value	Uncertainty	Uncertainty	Σ			Hazard	Hazard	Acute	Chronic
	Ē	Daily Acute intake Value (g/kg)	Value (g/kg)	Value (g/kg-day)	Value (g/kg)	(g/kg)	Adjustment	Adjustment	(g/kg)	Chron	Chronic TRV (g/kg)	Quotient	Quotient	Effect	Effect
44.1															
Winter Ingestion	2002														
	000/			2.0E-03	17.6	22	32	3200	0.55	Ġ.	.9E-03	1.9E-03	2.9E-01	2	2
	00001		4	1.0E-03	17.6	22	32	3200	0.55	9	9E-03	9.7E-04		2	2
	00081		4	4.1E-04	17.6	22	32	3200	0.55	9	.9E-03	3.9E-04		S.	2
	30000		_	2.0E-04	17.6	22	32	3200	0.55	9	9E-03	1.95-04	3.0E-02	2	Ž
	20000		9	1.0E-04	17.6	22	32	3200	0.55	9	6.9E-03	9.7E-05		2	2
	20000+		2	4.1E-05	17.6	22	32	3200	0.55	9	9E-03	3.9E-05		Ç	2
	20000++	1.1E-05	2	2.1E-05	17.6	22	32	3200	0.55	9	6.9E-03	1.9E-05	3.0E-03	Ž	Ž
				! !											2
*Acute critical effects are weight loss and lesions of theliver, spien, and kidney. Critical Study	weight loss a	nd lesions of theliver,	, spien, and kidr	. Critical Study:	Bramachari 1958										
"Chronic critical effect is gastrointestinal irritation. Critical Study: Lewis 1989	gastrointestin	al Irritation. Critical	Study: Lewis 19	89											
	i	Daily Acute		Т		"Chronic	Acute TRV	Chronic TRV	Acute			Acute	Chronic	I	
	a (E)		Area (m²)	dose (a/kg-day)	Acute Toxicity	Toxicity Value	Uncertainty	Uncertainty	TRV	į		Hazard	Hazard	Acute	Chronic
				16.00		(Au A)	The manual of the same	Aujuminent	(0) (D)	Caron	Chronic TRV (g/kg)	CUOTION	Quotient	Effect	Ellect
Winter Dermal Absorption														+	
	7500		2.8E-01	1.8E-05	2	216	32	320	90.0	9	6.8E-01	1 6E-01	2 6F-05	ž	2
	10000	_	2.8E-01	8.8E-06	2	216	32	320	90.0	9	6.8E-01	8.0E-02		Š	2
,	18000		2.8E-01	3.5E-06	2	216	32	320	90.0	9	6.8E-01	3.2F-02		2	2
	30000		2.8E-01	1.8E-06	2	216	32	320	0.06	9	6.8E-01	1 6F-02	ļ	2	2
	20000		2.8E-01	8.8E-07	2	216	32	320	90.0	8	8.8E-01	8 0F-03		2	Z
	\$0000÷		2.8E-01	3.5E-07	2	216	32	320	0.06	6	6.8E-01	3.2E-03	5.2F.07	2 2	2
	20000++	1.0E-04	2.8E-01	1.8E-07	2	216	32	320	90.0	9	6.8E-01	1.6E-03		2 2	2
														2	2
*Acute critical effect is slight to moderate skin irritation. Critical Study: Palmer 1990	ght to modera	te skin irritation. Crit	ical Study: Paln	ner 1990											
**Chronic critical effects are well defined enythema and edema. Critical Study: Lewis 1989	are well define	d erythema and ede.	ma. Critical Stu-	dy: Lewis 1989						T				T	
						4			1					1]

Bald eagle risk characterization for fog oil exposure under Pasquill Category D.

	Distance			Dally Chronic Intake	*Acute Toxicity	Toxicity Value	Incertainty	Incertaint.	VAL	Chronic	Curonic Dose	a la contra	Caronic	-	-
	(£)	Daily Acute Intake Value (g/m³)	ke Value (g/m³)	Value (g/kg-day)	Value (g/m³)	(g/m³)	Adjustment	Adjustment		TRV (g/m³)	(g/kg-day)	Quotient	Quotient	Effect	Effect
							-		T						
Summer Inhalation															
Musgrave Hollow	1														
South Nest		1.0E-04	-04	1.2E-07	8	0.1	32	320	1.88	3.1E-04	4.1E-04		3.0E-04		Š
New Per	┙	0.0E+00	ş	0.0E+00		0.1		320	1.88	3.1E-04	4.1E-04				2
North Nest	48211	0.0E+00	00+	0.0E+00		0.1		320	1.88	3.1E-04	4.15-04	0.0E+00		ž	2
Bally McCann Hollow				,											
South Nest		1.0E-04	-04	80-3Z:6	,	0.1		320	1.88	3.1E-04	4.15-04				2
Mid Nest		1.0E-84	-64	9.2E-08	09		32	320	1.88	3.1E-04	4.15-04	5.3E-05	2.2E-04	2	2
North Nest	44956	0.05+00	-00 -	0.0E+00				320	1.88	3.1E-04	4.1E-04				2
Mush Paddle Hollow															
South Nest	20749	1.05-04	94	7.7E-08		0.1		320	1,88	3.1E-04	4.1E-04	5.3E-05	1.9E-04		N N
Mid Nest		0.0E+00	00+	0.0E+00	09	0.1	32	320	1.88	3.1E-04	4.1E-04	l	l	Ž	ž
North Nest	49712	0.0E+00	00+	0.0E+00		0.1		320	1.88	3.1E-04	4.1E-04	0 OF+00	005+00		ž
Ballard Hollow															
South Nest		1.0E-04	-04	6.15-08	9	0.1		320	1.88	3.16-04	4.1E-04	5.3E-05	1.56-04		ž
Mid Nest		2.0E-04	-04	1,2E-07	9	0.1		320	1.88	3.15-04	4.1E-04				ž
North Nest	34057	0.0E+00	+00	0.0E+00	9	0.1	32	320	88	3.15-04	4.1E-04		L	2	2
Secure critical effect is of meritaneous		Critical Study Ships of al 1987	nn et al 1087												
hronic critical effects	are minor lesio	ins of the heart. live	er and tunos Cr	**Chronic critical effects are minor lesions of the head, liver and lunos. Critical Study. Diviser at a	1 1992										
					• 1					T					
		Daily Acute				Chronic	Acute TRV	Chronic TRV	Acute			Acute	Chronic		
, - -	Distance	intake Value	Skin Surface	Dermally absorbed	*Acute Toxicity	Toxicity Value	Uncertainty	Uncertainty	TRV	i		Hazard	Hazard	Acute	Chronic
				(Am Aus)	(Aug)	(Aug)	William To	Walle III	(aug	Chronk	Chichie Inv (g/kg)	Cuotient	Coomenu	CHEC	בוופנו
Summer Dermal Absorption	uo									+					
Muscrave Hollow									\dagger						
South Nest	25174	5.0E-04	2.8E-01	1.7E-06	2	216		320	900	9	6.8E-01	8.0F-03			Ž
Mid Nest	27956	5.0E-04		1.2E-06	2	216	32	320	900	9	6.8E-01	8.0E-03	1.8E-06	2	2
North Nest	48211	2.0E-04	2.8E-01	4.9E-07	2	216		320	98	8	6.8E-01	3.2E-03		ĺ	Ž
Bally McCann Hollow										-					
South Nest		1.0E-03		1.9E-06	2	216		320	90.0	9	6.8E-01	1.6E-02	2.7E-06		ž
Mid Nest		5.0E-04	2.8E-01	9.3E-07	2	216		320	90.0	8	8E-01	8.0E-03			2
North Nest	44956	2.0E-04	2.8E-01	3.7E-07	2	216	32	320	90.0	9	6.8E-01	3.2E-03		N _O	2
Mush Paddle Hollow															
South Nest		1.0E-03		1.5E-06		216		320	90.0	9	6.8E-01	1.6E-02			2
Mid. Nest	28050	5.0E-04	2.8E-01	7.7E-07	2	216	32	320	90.0	9	6.8E-01	8.0E-03	1.1E-06	2	2
North Nest	49712	2.0E-04	2.8E-01	3.1E-07	2	216		320	90.0	9	6.8E-01	3.2E-03			ž
Ballard Hollow									-						
South Nest		1.0E-04		1.2E-07	2	216	32	320	90.0	9	6.8E-01	1.6E-03	1.8E-07	ટ	2
Mid Nest		2.0E-03		2.5E-06	2	216	32	320	90.0	9	6.8E-01	3.2E-02		ž	2
North Nest	34057	5.0E-04	2.8E-01	6.2E-07	2	216	32	320	90.0	Ġ	6.8E-01	8.0E-03	9.2E-07		S
*Acute critical effects is slight to moderate skin irritation. Critical Study: Palmer 1990	light to moder	ate skin irritation.	Critical Study: P.	almer 1990											
"Chronic critical effects are well defined erythema and edema.	are well define	d enythema and ec	dema. Critical Stu	Critical Study: Lewis 1989											
			1	I					-				_		

Bald eagle risk characterization for fog oil exposure under Pasquill Category D.

Mobile Smoke															
						Chronic	Acute TRV	Chronic TRV	ACUTE		Chronic Dose	AC. III	S COUNTY		
	Distance		4	Daily Chronic Intake	*Acute Toxicity	Toxicity Value	Uncertainty	Uncertainty	TRV	Chronic	Adjusted TRV	Hazard	Hazard	Acute	Chronic
		Daily Acute intake value (grm.)	e value (g/m.)	Value (g/kg-day)	Value (g/m²)	(a/m²)	Adjustment	Adjustment	(a/m³)	TRV (g/m³)	(g/kg-day)	Quotient	Quotient	Effect	Effect
Winter inhelation															
	2500	1.05-02	02	8.8E-06		6	30	320	8	20 11 0	10 27 7			1	
	3000		03	4.4E-06	09	6	3 6	320	- F	3.10-04	4.16-04			€ :	2
	4500		03	1.8E-06		0.1	32	320	A B	100	7 10 0		1.15-02	2	Ž.
	9009	1.0E-03	63	8.8E-07		10	33	320	2	200	4.15-04	3010		2	Q.
	9500	5.0E-04	70	4.4E-07		5	22	220	3	5 0	201.			Ş	Ş
	16500	2.0E-04	8	1.8E-07		5	3 6	026	00.	2010	4.16.04			ટ	Š
	26500		2	8 8F-08		3 6	200	320	1.88	3.1E-04	4.1E-04	1.1E-04	4.36-04	ટ	Š
						5	76	350	89.	3.1E-04	4.1E-04	\perp		2	2
"Acute critical effect is oil pneumonia. Critical Study: Shinn et al. 1987	Il pneumonia.	Critical Study: Shin	nn et al. 1987												
"Chronic critical effects are minor lesions of the heart, liver and lungs.	are minor lesk	ons of the heart, live		Critical Study: Driver et a	al 1992					1					
						Chronic	Active vov	1184 212 214							
	Distance			Daily Chronic Intake	*Acute Toxicity	Toxicity Value	Uncertainty	Uncertainty	TRV			Acute	Chronic	Acute	Chronic
	Ē)	Dally Acute Intake Value (g/kg)	e value (g/kg)	Value (g/kg-day)	Value (g/kg)	(g/kg)	Adjustment	Adjustment	(g/kg)	Chron	Chronic TRV (g/kg)	Quotient	Quotient	Effect	Effect
Winter Ingestion															
	6500	1.1E-03	33	2.0E-03	17.6	22	62	3200	0 66		0000				
	8500	5.4E-04	7	1.0E-03	17.6	2	36	0000	200	9 9	30.00	20-12-03		2	Ž
	14500		24	4.1E-04	17.6	22	32	3200	0.55	۳	6 05 03	3.00.04		2	2
	22000	1, 1E-04	4	2.0E-04	17.6	22	32	3200	33.0		35-00	40-0		2	2
	35500	5.4E-05	35	1.0E-04	17.6	2	2	3200	200		0.95-03	2. ST-04		2	Š
	\$0000÷	2.1E-05	35	4.1E-05	17.6	22	32	3200	200		DE 03	3.75-03		2	Ž.
	\$0000÷+	1.1E-05	35	2.1E-05	17.6	22	33	3200	2000	0	0.90-03	3.95-05		2	S
						1	70	0076	0.00	P	35-03	1.95-05	3.0E-03	2	Š
"Acute critical effects are weight loss and lesions of the liver, spieen, and kidney. Critical Study	weight loss as	nd lesions of the live	ir, spleen, and k	٦.,	Bramachari 1958				1	+					
"Chronic critical effect is gastrointestinal Irritation. Critical Study: Lewis 1989	s.gastrointestin	nal Irritation. Critical	Study: Lewis 15	.											
										1					
		Г				Chronic	Acute TRV	Chronic TRV	Acute			A Colored	0,000		
	Distance	š	Skin Surface	Dermaily absorbed	*Acute Toxicity	Toxicity Value	Uncertainty	Uncertainty	TR\			Hazard	Hazard	Acute	Chronic
	Ē	(a/m)	Area (m²)	dose (g/kg-day)	Value (g/kg)	(g/kg)	Adjustment	Adjustment	(g/kg)	Chronk	Chronic TRV (g/kg)	Quotient	Quotient	Effect	Effect
Winter Dermai Absorption	5														
	6500	1.0E-02	12	1.8E-05	2	216	22	320	90.0		6 95 04	10,10	10 10		-
	8200	5.0E-03	33	8.8E-06	2	218	2	220	3 6	١	10-20	1.05-01	2.0E-US	2	2
	14500	2.0E-03	33	3.5E-06	2	216	32	320	90.0	0	0.0E-U1	8.0E-02	1.3E-05	2 :	ž
	. 22000	1.0E-03	13	1.8E-06	2	216	32	320	800		6.0E-01	3.45-02		2	S.
	35500	5.0E-04	4	8.8E-07	2	216	32	320	800	0	0.00-01	1.05-02		2 :	2
	20000+		4	3.5E-07	2	216	2	320	900		C.O. 04	2000		2	2
	++00005	1.0E-04	7	1.8E-07	2	216	32	320	9	9	6 OF 04	3.25-03	0.2E-0/	Q:	S.
							75	020	9	١	10-10	1.65-03	2.6E-07	2	Ž
*Acute critical effects is slight to moderate skin irritation. Critical Study: Palmer 1990	light to moder.	ate skin irritation. Cr	ritical Study: Pa	lmer 1990						1					
**Chronic critical effects are well defined erythema and edema. Critical Study: Lewis 1989	are well define	d erythema and ede	ma. Critical Stu	dy: Lewis 1989										1	
					1				1						

Bald eagle risk characterization for fog oil exposure under Pasquill Category C.

Daily Acute Intake Value (g/m²) Daily Acute Intake Value (g/m²) Value (g/kg-day)	Daily Acute Intake Value (g/m²) 0.0E-00 0.0E-0	al. 1987	Value (gi/kg-day) Value (gi/kg-day) 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00	Value (g/m³) Value (g/m³) 60 60 60 60 60 60	(g/m³)	Uncertainty Adjustment	Uncertainty Adjustment	(g/m³)	Chronic TRV (g/m³)	Adjusted TRV (g/kg-day)	Quotient	Hazard Quotlent	Acute	Chronic
Isgrave Hollow South Nest 25174 South Nest 27956 North Nest 27956 North Nest 19717 South Nest 19717 Mid Nest 23623 North Nest 23623 North Nest 23623 North Nest 29050 Mid Nest 29050 Mid Nest 19717 North Nest 20749 Mid Nest 19712 North Nest 19717 North Nest 19712 North Nest 19712 North Nest 19717 North Nest 19850 Ald Nest 11677 North Nest 11677 North Nest 11677 North Nest 11677 North Nest 11677 North Nest 11677 North Nest 11677 North Nest 11677 North Nest 11677 North Nest 11677 North Nest 11677 North Nest 11677 North Nest 11677 North Nest 11677 North Nest 11677 North Nest 11677	0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 1.0E-04 1.0E-04 1.0E-04 1.0E-04 1.0E-04 1.0E-04 1.0E-04	al. 1987	0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00	99 99 99 99		32								
Inmer Inhalation Isgrave Hollow South Nest 27956 Mid Nest 27956 North Nest 19717 South Nest 19717 Illy McCann Hollow North Nest 19717 North Nest 2965 Ish Paddle Hollow North Nest 2965 North Nest 29749 Mid Nest 29750 Mid Nest 19712 North Nest 29750 North Nest 29050 North Nest 29050 North Nest 29050 North Nest 29050 North Nest 29050 North Nest 29050 North Nest 29050 North Nest 29050 North Nest 29050 North Nest 29050 North Nest 29057 North Nest 34057 North Nest 34057 North Nest 34057	0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 1.0E+00 0.0E+00 0.0E+00 1.0E+00 1.0E+00 0.0E+00	al. 1987	0.0E+00 0.0E+000 0.0E+	09 09 09		32								
South Nest 25174 South Nest 25174 South Nest 27956 North Nest 48211 South Nest 48211 South Nest 4916 South Nest 20149 South Nest 20149 South Nest 20149 Muld Nest 20149 Muld Nest 20150 North Nest 20150 North Nest 20150 North Nest 20150 North Nest 34057 South Nest 11617 North Nest 34057 North Nest 34057 North Nest 34057 North Nest 34057 North Nest 34057 North Certical effect is all minor lessons of the critical effect is all minor lessons of the critical effect is all minor lessons of the critical effect is all minor lessons of the critical effect is all minor lessons of the critical effect is all minor lessons of the critical effect is all minor lessons of the critical effect is all minor lessons of the critical effect is all minor lessons of the critical effects are minor l	0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 1.0E-00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00	al. 1987	0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00	09 09 09		32								
South Nest 25174 Mid Nest 17956 Mid Nest 18717 South Nest 19717 Mid Nest 23623 Mid Nest 23623 South Nest 20749 South Nest 20749 Mid Nest 20050 Mid Nest 20050 Mid Nest 17463 South Nest 17463 Mid Nest 17463 Kuth Critical Photom In Instruction of Instruction I	0.0E+00 0.0E+0	al. 1987	0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00	8 8 8 8 8		32					- 1			
Mid Nest 27956	0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 1.0E-04 1.0E-04 1.0E-04 1.0E-04 1.0E-04 0.0E+00 0.0E+00 1.0E-04 1.0E-04 0.0E+00	al. 1987	0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00	9 9 9	0.1		320	1.88	3.16.04	4.1E-04		0.0E+00	2	ž
North Nest 48211 North Nest 19717 South Nest 19717 South Nest 20749 South Nest 20749 Mid Nest 20749 Mid Nest 20749 Mid Nest 20749 Mid Nest 17463 Mid Nest 11677 North Nest 11677 North Nest 10677 North Nest 10677 North Nest 10677 North Nest 10677 North Nest 10677 North Nest 10677 North Nest 10677 North Nest 10677 North Nest 10677 North Nest 10677 North Nest 10677 North Nest 10677 North Nest 10677 North Nest 10677 North Nest 10678 North Nest North Nest 10678 North Nest North Nest 10678	0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 1.0E-04 1.0E-04 1.0E-04 1.0E-04 1.0E-04 1.0E-04 1.0E-04	al. 1987	0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00	09 09 09	0.1	32	320	1.88	3.1E-04	4.1E-04	0.0E+00	0.0E+00	S S	2
Ily McCann Hollow 19717 South Nest 19717 South Nest 19717 South Nest 44956 South Nest 28050 Mid Nest 28050 Mid Nest 17463 Mid Nest 11677 Mid Nest	0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00	al. 1987	0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00	09 09	0.1	32	320	1.88	3.1E-04	4.1E-04		0.0E+00	Š	No
South Nest 19717 Mid Nest 23623 Noth Nest 44956 South Nest 20749 Mid Nest 20050 Mid Nest 20050 Mid Nest 17463 South Nest 17463 Mid Nest 17463 Kuth Nest 1763 Mid Nest 1763 Cutle critical effect is oil pneumonia. Critical Chronic critical effects are minor lesions of the c	0.0E+00 0.0E+000 0.0E+000	al. 1987	0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00	8 8 8										
Mid Nest 23623	0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 1.0E-04 1.0E-04 1.0E-04 0.0E+00 1.0E-04 1.0E-04 1.0E-04 1.0E-04	al. 1987	0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00	9 6	0.1	32	320	1.88	3.1E-04	4.1E-04			Š	2
North Nest 44956	0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 1.0E-04 1.0E-04 1.0E-04 1.0E+00 1.0E+00 1.0E+00	al. 1987	0.0E+00 0.0E+00 0.0E+00 0.0E+00	S	0.1	32	320	1.88	3.1E-04	4.1E-04	00+30:0	0.0E+00	No	No
South Nest 20749	0.0E+00 0.0E+00 0.0E+00 0.0E+00 1.0E-00 1.0E-00 0.0E+00 0.0E+00 0.0E+00 1.0E+00 0.0E+00 0.0E+00	al 1987	0.0E+00 0.0E+00 0.0E+00	}	0.1	32	320	1.88	3.1E-04	4.15-04			Š	Ş
South Nest 20749 Mid Nest 28050 North Nest 49712 Illard Hollow South Nest 17463 Mid Nest 11677 North Nest 34057 Cutle critical effect is oil pneumonia. Critical Chronic critical effects are minor tasions of the critical effects are minor tasions and the critical effects are minor tasions and the critical effects are minor tasions and the critical effects are minor tasions and the critical effects are minor tasions and the critical effects are minor tasions and the critical effects are minor tasions and the critical effects are minor tasions and the critical effects are minor tasions and the critical effects are minor tasions and the critical effects are minor tasions and the critical effects are minor tasions and the critical effects are minor tasions and the critical effects are minor tasions and the critical effects are minor tasions and the critical	0.0E+00 0.0E+00 0.0E+00 0.0E+00 0.0E+00 1.0E-04 0.0E+00 0.0E+00 1.0E-04 0.0E+00 0.0E+00 0.0E+00	al. 1987	0.000											
Mid Nest 28050 North Nest 49712 Illard Hollow South Nest 17463 South Nest 17463 Mid Nest 11677 North Nest 34057 Cute critical effect is oil pneumonia. Critical Chronic critical effects are minor lesions of the critical effects are minor les	0.0E+00 0.0E+00 0.0E+00 1.0E-04 1.0E-04 0.0E+00 0.0E+00 1.0E-04 1.0E-04 1.0E-04	al. 1987	0.0E+00	8	₽.O	32	320	1.88	3.1E-04	4.1E-04	00+30'0		Se.	S
Ilard Hollow South Nest 17463 South Nest 11677 Mid Nest 11677 North Nest 34057 Cute critical effect is oil pneumonia. Critical Chronic critical effects are minor lessons of the critical effects are	0.0E+00 0.0E+00 1.0E-04 0.0E+00 0.0E+00 1.0E-04 0.0E+00 1.0E-04	al. 1987	0.0E+00	09	0.1	32	320	1.88	3.1E-04	4.1E-04			Š	S
liard Hollow South Nest 17463 Mid Nest 1677 North Nest 34057 Cute critical effect is oil pneumonia. Critical	0.0E+00 1.0E-00 0.0E+00 0.0E+00 1 Shinn et al	al. 1987 Tungs. Critic	0.0E+00	09	0.1	32	320	1.88	3.1E-04	4.15-04			ş	2
South Nest 17463 Mid Nest 11677 North Nest 34057 Cute critical effect is oil pneumonia. Critical Chronic critical effects are minor tesions of the critical	0.0E+00 1.0E-04 0.0E+00 0.0E+00 all Study: Shinn et al the heart, liver and i	al. 1987 lungs, Critic	0.05+00											
Mid Nest 11677 North Nest 34057 Cute critical effect is oil pneumonia. Critical Chronic critical effects are minor lesions of the critical effects are mino	1.0E-04 0.0E+00 0.0E+00 al Study: Shinn et al the heart, liver and i	al. 1987 Iungs, Critic		8	0.1	32	320	1.88	3.15-04	4.15-04		0.0E+00	Š	Š
North Nest 34057 cute critical effect is oil pneumonia. Critical Chronic critical effects are minor lesions of the critical effects are minor lesions.	0.0E+00 al Study: Shinn et al the heart, liver and i	al. 1987 Tungs. Critic	8.1E-08	99	0.1	32	320	1.88	3.15-04	4.15-04	_	1.5E-04	Š	2
cute critical effect is oil pneumonia. Critical Chronic critical effects are minor lesions of the	al Study: Shinn et al the heart, liver and I	al. 1987 I lungs. Critica	0.0E+00	9	0.1	32	320	1.88	3.1E-04	4.15-04	0.0E+00	0.0E+00	Š	Ş
cute critical effect is oil pneumonia. Critical chiconic critical effects are minor lesions of the critical effects are minor lesions of the critical effects are minor lesions.	the heart, liver and I	at. 1987 Tungs. Critics												
Chronic critical effects are minor lesions of the	the heart, iver and it	lungs. Critics												
	any Acute	_		1992										
100	Γ-	_												
-	_	-			Chronic	Acute TRV	Chronic TRV	Acute			Acute	Chronic	_	
*	5	908	·	Acute Toxicity	Toxicity Value	Uncertainty	Uncertainty	₹.			Hazard	Hazard	Acute	Chronic
(E)	(g/m²) Area (m²)	1	dose (g/kg-day)	Value (g/kg)	(g/kg)	Adjustment	Adjustment	(g/kg)	Chronic	Chronic TRV (g/kg)	Quotient	Quotient	EMed	EHect
		1						1	+				+	
Summer Dermal Absorption									+					
												30.00		
h Nest		2.8E-01	8.6E-07	2	216	32	320	90.0	9	6.8E-01	1.6E-03	1.35-06	2	2
Mid Nest 27956	1.0E-04 2.8	2.8E-01	2.5E-07	2	216	32	320	90.0	9	6.8E-01	1.6E-03	3.7E-07	Ŝ.	2
North Nest 48211		8E-01	2.5E-07	2	216	32	320	0.06	9	6.8E-01	1.6E-03	3.7E-07	2	2
Baily McCann Hollow												1		
South Nest 19717		2.8E-01	3.7E-07	2	216	32	320	90.0	9	6.8E-01	3.2E-03		2	2
Mid Nest 23623		2.8E-01	3.7E-07	2	216	32	320	90.0	9	6.8E-01	3.2E-03	5.5E-07	Š	2
North Nest 44956		2.8E-01	0.0E+00	2	216	32	320	90.0	· i	6.8E-01	0.0E+00	0.0E+00	Š	2
									-				Ì	
South Nest 20749		2.8E-01	7.7E-07	2	216	32	320	90.0	ý.	6.8E-01	8.0E-03			2
Mid Nest 28050	1.0E-04 2.8	2.8E-01	1.5E-07	2	216	32	320	90.0	é	6.8E-01	1.6E-03	2.3E-07	£	2
North Nest 49712	0.0E+00 2.8	2.8E-01	0.0E+00	2	216	32	320	90.0	ý.	8E-01	0.0E+00			온
South Nest 17463		2.8E-01	2.5E-07	2	216	32	320	0.08	ė.	6.8E-01	3.2E-03		2	S.
L	5.0E-04 2.8	2.8E-01	6.2E-07	2	216	32	320	90.0	Ġ	6.8E-01	8.0E-03	9.2E-07	2	S
North Nest 34057	1.0E-04 2.8	2.8E-01	1.2E-07	2	216	32	320	90.0	9	6.8E-01	1.6E-03		2	2
"Acute critical effect is slight to moderate skin irritation. Critical Study: Palmer 1990	'n Irritation. Critical S	Study: Palme	ar 1990											
"Chronic critical effects are well defined enythema and edema. Critical Study: Lewis 1989	thema and edema. (Critical Study	r: Lewis 1989											
								_						

Bald eagle risk characterization for fog oil exposure under Pasquill Category C.

Mohile Smoke															
	Distance			Dally Chronic Intake		Toxicity Value	Acute TRV Uncertainty	Chronic TRV Uncertainty	Acute	Chronic	Chronic Dose Adjusted TRV	Acute	Chronic	Acute	Chronic
	ξ	Daily Acute Intake Value (g/m²)	ke Value (g/m²)	Value (g/kg-day)	Value (g/m³)	(g/m³)	Adjustment	Adjustment	(g/m³)	TRV (g/m³)	(g/kg-day)	Quotient	Quotient	Effect	Effect
Winter Inhalation															
	3000	20.													
	200		70.	9.95-09			32	320	1.88	3.15-04	4.1E-04	5.3E-03	2.1E-02	Š	2
	300		3	4.4E-06			32	320	1.88	3.15-04	4.1E-04			2	Ž
	3		60	1.8E-06			32	320	1.88	3.1E-04	4.1E-04	1.1E-03		2	Ž
	4500		8	8.8E-07	9	0.1	32	320	1.88	3.1E-04	4.1E-04		2 1E-03	2	Ž
	2000		00	4.4E-07			32	320	1.88	3.1E-04	4.1E-04	L	1 1F-03	ž	2
	0005		8	1.8E-07			32	320	1.88	3.1E-04	4 15.04	Į.	4 3E 04	2	2 4
	14000	1.0E-04	8	8.8E-08			32	320	1.88	3.1E-04	4 1F-04		2 4E-04	2	2 2
											10.00		10.1	2	2
"Acute critical effect is oil pneumonia. Critical Study: Shinn et al. 1987	I pneumonia.	Critical Study: Shi	Inn et al. 1987											†	
**Chronic critical effects are minor lesions of the heart, liver and lungs. Critical Study: Driver el	are minor lesk	ons of the heart, live	er and lungs. Cr.		al. 1992										
	Distance					Chrone	Acute TRV	Chronic TRV	Acute			Acute	Chronic	T	
	(m)	Dally Acute Intake Value (g/kg)	ke Value (g/kg)	Value (g/kg-day)	Value (g/kg)	Toxicity Value (g/kg)	Uncertainty Adjustment	Uncertainty	TRV (g/kg)	Chronic	Chronic TRV (a/ka)	Hazard	Hezard	Acute	Chronic
													111111111111111111111111111111111111111		
Winter Ingestion															T
	3000		-03	2.0E-03	17.8	22	32	3200	0.55		A GE DA	1 00.03	2 05 04	1	
	4000		-04	1.05-03			32	3200	0.55		6 9E.03	75.04	4.8E-01	2 2	2
	2000		90	4.1E-04	17.6		32	3200	0.55	9	9E-03	3 05 04	200	2 2	2
	8200		-04	2.0E-04			32	3200	0.55	9	A 9E-03	100	3.0E.02	2 2	2
	12000		-05	1.0E-04.	17.6		32	3200	0.55	9	95.03	0 7E OK	3.0E-02	2 2	2 2
	24000		-05	4.1E-05	17.6		32	3200	0.55	9	6 9F-03	3 05 05	A OE 02	2 2	2
	40000	1.1E-05	95	2.1E-05	17.6	22	32	3200	0.55	٥	6 95.03	4 OF OR	3 00-03	2 2	2 2
										<u>}</u>	35-00	1.35-00	3.05-03	2	2
*Acute critical effects are weight loss and lesions of the liver, spieen, and kidney. Critical Study	weight loss a	nd lesions of the liv	er, spleen, and k	1	Bramachari 1958									1	
"Chronic critical effect is gastrointestinal irritation. Critical Study: Lewis 1989	s gastrointestir	al irritation. Critica	1 Study: Lewis 1:	_											
													1	-	
						Chronic	Acute TRV	Chronic TRV	Active				21-0-1		
	Distance	<u> </u>	Skin Surface	Dermaily absorbed	*Acute Toxicity	Toxicity Value	Uncertainty	Uncertainty	TR\			Havard	Harand	Anista	- 1
	Ê	(g/m²)	Area (m²)	dose (g/kg-day)	Value (g/kg)	(g/kg)	Adjustment	Adjustment	(a/ka)	Chronic	Chronic JRV (a/ka)	Quotlent	Orotions	Fifere	Effect
														130	138113
Winter Dermai Absorption															
	3000			1.8E-05	2	216	32	320	90.0	9	6.8E-01	165.01	2 65.06	2	O.A.
	4000			8.8E-06	2	216	32	320	900	9	6 AF-01	A OF OS	36.05	2 2	2
	2000			3.5E-06	2	216	32	320	0.06	9	6.8E-01	3.2F.02	5 2E 08	2 2	2 2
	8500			1.8E-06	2	216	32	320	900	9	\$F_01	4 85 03	30 19 0	2	2 2
	12000		2.8E-01	8.8E-07	2	216	32	320	90.0	9	6 RE-04	A OF OR	2 4	2 2	2 2
	24000			3.5E-07	2	216	32	320	900		F-04	3 20 03	20.00	2 2	2 2
	40000	1.0E-04	2.8E-01	1.8E-07	2	216	33	320	900		0.00	3.2E-05	0.45-07	2 2	2
								3	3		00-01	20-03	70-20.7	2	2
*Acute critical effect is slight to moderate skin irritation. Critical Study: Palmer 1990	ight to moderal	te skin irritation. Cr	ritical Study: Pali	mer 1990				1				†	1	1	
**Chronic critical effects are well defined erythema and edema. Critical Study: Lewis 1989	are well define	d erythema and ed	ema. Critical Stu	ldy: Lewis 1989								1			
	_								1			†	+	+	T
									_	_		_		_	_

Bald eagle risk characterization for fog oil exposure under Pasquill Category B.

						Chronic	Acute TRV	Chronic IRV	ייייייייייייייייייייייייייייייייייייייי	_					
	Distance			Dally Chronic Intake	*Acute Toxicity	Toxicity Value	Uncertainty	Uncertainty	TRV	Chronic	Adjusted TRV	Hazard	Hazard	Acute	Chronic
	Œ	Dally Acute Intake Value (g/m²)	• Value (g/m²)	Value (g/kg-day)	Velue (g/m²)	(m/6)	Adjustment	Adjustment	III/A	I W IBI	(fan Auga)				
				,											
Summer Inhalation															
Musgrave Hollow		0.430	٤	004900	8	0.1		320	1.88	3.1E-04	4.1E-04		-	ž	
SOUTH NEST	2017	0.00	3 5	004900	8	0	32	320	1.88	3.15-04	4.15-04	0.0E+00	0.0E+00		ž
New DIM	2/300	10.00	3 2	200		-		320	1.88	3.1E-04	4.1E-04			S.	
North Nest	48211	0.0=+00	8	0.00								L			
Bally McCann Hollow				00.70			33	320	1.88	3.1E-04	4.1E-04	L			2
South Nest	19717	0.0E+00	8	0.05+00	8 8	5		320	1 88	3.15.04	4.1E-04	0.0E+00		No.	
MKI Nest	23623	0.0E+00	8	0.05+00		0	70	000	98 7	200	A 15.04	L	١		
North Nest	44956	0.0E+	8	0.0E+00	9	0.1		920	1.00	0. 10	1		1		
Mush Paddle Hollow								-		,,,,,		00+30			
South Nest	20749		8	0.0E+00	8	0.1	32	320		1	10 L		001100	2	2
Task Page	28050	0.05+00	8	0.0E+00		0.1		320	1.88	1	4 10	0.00			
North Nest	49712	0.0E+00	8	0.0E+00		0.1	32	320		3.15-04	4.15-04				
Ratiard Hollow													_		
New Charles	17463	0.0E+00	8	00+30'0	9	0.1		320							
New News	11677	0 OF+	8	0.0E+00	8	0.1	32	320			4.1E-04	0.0=+00	0.05	2	2
Section 1	L	00+30 0	8	0.0E+00		0.1	32	320	1.88	3.1E-04	4.1E-04				
TERM INION	L														
Critical Study: Shinnet at 1987	elacanieaa	Critical Study: Shin	1987 at 1987												
Acute cracat enect is on	Diedile.			Drhine of	1 1000										
*Chronic critical effects are minor lesions of the heart, liver and inrigs. Cirical crucy.	are minor lesk	ons of the hear, live	si and lungs. Cit	10	7001										
		Tall tall tall tall tall tall tall tall				Chronic	Acute TRV	Chronic TRV	Acute			Acute	Chronic		
	Dietarce	_	Skin Surface	Dermally absorbed	*Acute Toxicity	Toxicity Value	Uncertainty	Uncertainty	TRV			Hazard	Hazard	Acute	Chronic
	ξ		Area (m²)	dose (g/kg-day)	Value (g/kg)	(g/kg)	Adjustment	Adjustment	(g/kg)	Chro	Chronic TRV (g/kg)	Quotient	Quotient	13801	Ellect
		Γ				7					-			1	
Summer Dermal Absorption	no														
Miledrave Hollow												100			
then thron	25174	0.0E+00	2.8E-01	0.0E+00	2				90.0		6.8E-01	0.05		2 3	
Mid Neet	L	0.0E+00		0.0E+00	2		32	320			6.8E-01	0.0=+00	00000		2 2
North Nest	L	0.0E+00		0.0E+00					0.06		6.8E-01	0.00			
Bally McCann Hollow	L										0 0E 04	1 65.03	3 7E-07		
South Nest	19717	1.0E-04	2.8E-01								0.00		l		
Mid Nest	23623	0.0E+00	2.8E-01		2	216	32	320	0.00		0.00-01	200	00490	2	2
North Nest	L	0.0E+00	2.8E-01	0.0E+00	2						0.05-01	2			
Mush Paddle Hollow	L								000		0 00 00	0		S C	
South Nest	20749	0.0E+00				216					0.00-01	0.00			
Mid Nest	L	0.0E+00	2.8E-01		2		32	320	0.06		5.8E-U1	2000	2000		2
North Nest	L	0.0E+00		0.0E+00	2	216					6.8E-U1	0.00			
Ballard Hollow	L											1, 27	4 95 07	1	
South Meet	17463	1.0E-04	2.8E-01	1.2E-07	2	216	32	320			6.8E-01	1.00.0			2 2
Mary Name	L	2 0F-04							0.06		6.8E-01	3.2E-03			
MIN INCA	L	0 0F+00			2						6.8E-01	0.0E+00	0.05+00	2	
NOUTI MEST	1	20.70.0													
		Total selection	rational Character Do	1000 ton											
*Acute critical effect is sugnit to inodelate skill initiation. Critical order: 1959	igni to model	die Sani Hillaudii. C	Chinesi Chary.	. de 1 aude 4000											
**Chronic critical effects arewell defined erythema and edellia. Critical Study. Lewis 1303	arewell define	ed erymema and ed	Sellia. Cilical Si	day. Lewis 1505											

Bald eagle risk characterization for fog oil exposure under Pasquill Category B.

Secondary Toxicity Value Acute TR	Mobile Smoke						7 (:-B	. i								
Acute Toxicity Toxicity Value Uncertain Activation																
Acute TRY Acute TRY		Distance (m)	Dally Acute Intak	e Value (g/m³)			Toxicity Value	Acute TRV Uncertainty	Chronic TRV Uncertainty	Acute TRV	Chronic	Chronic Dose Adjusted TRV	Acute	Chronic	Acut•	Chronic
Acute Toxicity Acute TRX	Vinter Inhalation							Walliani A	Adjustiment.	(E)	TRV (g/m²)	(g/kg-day)	Quotient	Quotlent	Effect	Effect
Action A		4000		93	100											
Act Column Colu		4000		93	0.0E-U0			32	320	1.88	3.1E-04	4.1E-04	5.3E-03	2.15.02	2	1
SEE-07 60 0.1		4000		03	1.8E-06			32	320	1.88	3.1E-04	4.1E-04	L		2	2 2
LE-07 60 0.1		2000		03	8.8E-07.			32	320	1.88	3.1E-04	4.1E-04		4.3E-03	2	2
New Part 1992 New Part 1992 New Part 1992 New Part 1992 New Part 1992 New Part 1992 New Part 1993 New Part 1993 New Part 1993 New Part 1993 New Part 1993 New Part 1993 New Part 1994 New Part 1995 New Part 1995 New Part 1995 New Part 1995 New Part 1995 New Part 1995 New Part 1995 New Part 1995 New Part 1995 New Part 1995 New Part 1995 New Part New Part 1995		2000		904	4.4E-07			32	320	1,88	3.1E-04	4.1E-04	j		2	2
Ner et al. 1992 "Chronic Acute TR Intake "Acute TR Toxicity Value (g/kg) Gg/kg) Adjustment Ge-03 17.6 22 22 17.6 22 22 22 22 22 22 22		7000		94	1.8E-07			32	320	1.88	3.1E-04	4.1E-04		1.15-03	2	Ž
Ner et al. 1992		0006		94	8.8E-08			32	320	1.88	3.1E-04	4.1E-04		4.3E-04	2	2 5
Intake								32	320	88.	3.1E-04	4.1E-04	5.3E-05	2.15-04	2	2 2
Ner et al. 1992 Chicolic Acute TR	Acute critical effect is o	Il pneumonia.	Critical Study: Shin	nn et al. 1987									l			2
Intake 'Acute Toxicity Toxicity Value Adjustment	Chronic critical effects	are minor lesk	ons of the heart, live	r and lungs. Ca		ıl. 1992										
Intake Acute Toxicity Toxicity Value Uncertains																
Intake		i					Chronic	Acute TRV	Chronic vov.							
OE-03 17.6 22 22 22 22 22 22 22		Distance					Toxicity Value	Incertainty	Cilionic IRV	Acute			Acute	Chronic		
17.6 22 22 22 22 22 22 22		Ē	Daily Acute Intake	• Value (g/kg)			(a/ka)	Adjustment	Oncertainty	TRV			Hazard	Hazard	Acute	Chronle
CE-04 17.6 22 22 22 22 22 22 22								11000000	Aujustinent	(gykg)	Chronic	Chronic TRV (g/kg)	Quotient	Quotlent	Effect	Effect
17.6 22 22 23 24 25 25 25 25 25 25 25	inter Ingestion							1								
17.6 22 22 23 24 24 25 25 25 25 25 25		000		33	2.0E-03		200			1						
15-04 17.6 22 22 22 22 22 22 22		2000		4	1.0E-03		22	35	3200	0.55	9	6.9E-03	1.9E-03	2.9E-01	2	2
17.6 22 22 22 23 24 25 25 25 25 25 25 25		9009		4	4.1E-04		16	35	3500	0.55	9	9E-03	9.7E-04	1.5E-01	Š	2
15.05 17.6 22 15.05 17.5 22 15.05 17.5 22 15.05 17.5 22 17.5 22 17.5 22 17.5 22 17.5 17.		7500		7	2.0E-04		27 6	35	3200	0.55	9	6.9E-03	3.95-04	5.9E-02	2	CZ.
FE-05 17.6 22 22 22 22 22 22 23 23 24 24		9500		5	1.0E-04	-	27 5	35	3200	0.55	9,5	9E-03	1.9E-04	3.0E-02	Ş	Ž
Foot 17.6 22 22 23 24 25 25 25 25 25 25 25		14500		9	4.1E-05		27 62	35	3200	0.55	6.5	9E-03	9.7E-05	1.5E-02	2	2
Study: Bramachari 1958 Table Acute TRV		20000		5	2.1E-05		2 2	35	3200	0.55	6.5	6.9E-03	3.9E-05	6.05-03	2	2
Study: Bramachari 1956 Texture TRY Texture Try Texture (g/kg) Texture (g/kg) Texture (g/kg) Adjustment Texture (g/kg) Adjustment Texture (g/kg) Adjustment Texture (g/kg) 2 2 2 2 2 2 2 2 2							*	75	3200	0.55	6.9	6.9E-03	1.9E-05	3.0E-03	શ્	2
The content of the	cute critical effects are	weight loss ar	nd lesions of the live	r, spleen, and k	by. Critical Study:	Bramachari 1958				1						
ribed "Acute Toxicity Toxicity Value Uncertaint (g/kg) Adjustment (g/kg) Adjustment (g/kg) Adjustment (g/kg) Adjustment (g/kg) Adjustment (g/kg) Adjustment (g/kg) Adjustment (g/kg) 2 216 216 216 216 216 216 216 216 216 2	Chronic critical effect is	gastrointestin	al irritation. Critical	Study: Lewis 1!												
Acute Toxicity Toxicity Value Uncertaint Valu									+							
### Adjustmer (g/kg) Adjustmer							Chronic	Acute TRV	Thronia 180				-			
Adjustmer (g/kg) Adjustmer (Distance (1)		Kin Surface	Dermally absorbed	*Acute Toxicity		Uncertainty	Uncertainty	TOV			Acute	Chronic		
8E-05 2 216 8E-06 2 216 8E-06 2 216 8E-07 2 216 8E-07 2 216 8E-07 2 216		Î.	T	rea (m.)	dose (g/kg-day)	Value (g/kg)	_	Adjustment	Adjustment	(a/ka)	Chronic	Chronic TRV (alka)	Hazard	Hazard	Acute	Chronic
8E-05 2 216 8E-06 2 216 8E-06 2 216 8E-07 2 216 8E-07 2 216 8E-07 2 216	inter Dermai Absorption										-			- Inotion	EHOCI	Effect
8E-05 2 216 8E-06 2 216 8E-07 2 216 8E-07 2 216 8E-07 2 216			1 0F.03							-			+	+		
SE-06 2 216 SE-06 2 216 SE-07 2 216 SE-07 2 216 SE-07 2 216		5000	5 OE-03		20-20-03	2	216	32	320	90.0	6.8	6 8F-01	4 85 04	2000	-	:
2 216 8E-06 2 216 8E-07 2 216 8E-07 2 216 8E-07 2 216		0009	2 OE-03	,	9.95	2	216	32	320	90.0	88	8.8F-01	S a	200-00	2	2
8E-06 2 2:16 BE-07 2 2:16 BE-07 2 2:16 BE-07 2 2:16		7500	4 00 03		3.35-06	2	216	32	320	900	8.8	6 RE O1	20-07 20 00	1.35-05	2	Ž
85-07 2 216 85-07 2 216 85-07 2 216		9500	100.0		1.8E-06	2	216	32	320	900	3	6 95 04	3.25-02	975-06	S Z	ş
3.5E-07 2 216 1.8E-07 2 216 1.989		14500	9.000		8.8E-07	2	216	32	320	900	9	6 0E 04	1.0E-02	2.6E-06	2	Š
5 2 216		0000	2.0E-0.4		3.5E-07	2	216	32	320	300	0.0	200	8.0E-03	1.3E-06	2	Š
		00007	1.0E-04		1.8E-07	2	216	32	320	9 9	0.0	0.00-01	3.2E-03	5.2E-07	2	No
*Chronic critical effects arewell defined erythema and edema. Critical Study: Lewis 1989	vite entires affect to atte	44.						+	7,7	8.5	0.0	6.8E-01	1.6E-03	2.6E-07	Š	N
Chromic critical entects arewell defined erythema and edema. Critical Study: Lewis 1989	hone citical effects an	ont to moderate	e skin irritation. Criti	cal Study: Pair	ner 1990		-		+	+	+		+			
	month clineal bitects a	Deuting (same)	erythema and eden	na. Critical Stuc	y: Lewis 1989			-		-						
		-														
						1		1		1	-				-	Γ

Attachment H: Terephthalic Acid (TPA) Grenades

Bald eagle risk characterization for TPA exposure under Pasquill Category B.

TPA Smoke Grenade															
	Distance			Dally Chronic Intake "Acute To	xlclfy	Toxicity Value	1	Chronic TRV Uncertainty	Acute TRV	Chronic	Chronic Dose Adjusted TRV	Acute Hazard	Chronic Hazard	Acute	Chronic
	(m)	Daily Acute Inta	ke Value (g/m³)	Daily Acute Intake Value (g/m³) Value (g/kg-day)	Value (g/m³)	(g/m³)	Adjustment	Adjustment	(g/m³)	TRV (g/m³)	(g/kg-day)	Quotient	Quotient	Effect	Effect
Winter Inhalation															
	3000	9.0E+00	+00	3.0E-06		9.8	32	096		9.0E-03	3.0E-06			Yes	Š
	4000	5.0E-03	-03	1.7E-09	8.6	3.8	32	096	1	9.0E-03	3.0E-06	l		Š	Š
	4000	2.0E-03	-03	6.7E-10		8.6	32	096		9.0E-03	3.0E-06			S.	ž
	4000		1.0E-03	3.4E-10		9.8	32	960	ļ	9.0E-03	3.0E-06	l			Š
	2000	5.0E-04	-04	1,7E-10		8.6	32	096	2.7E-01	9.0E-03	3.0E-06	1.9E-03	5.6E-05	Š	No
	2000	2.0E-04	-04	6.7E-11	8.6	9.8	32	096	1	9.0E-03	3.0E-06			Š	N _o
	0009		1.0E-04	3.4E-11	8.6	8.6	32	096		9.0E-03	3.0E-06	3.7E-04	1.1E-05	No	N
ute critical effects ar	e necrosis and	nflamation of the n	asal cavity. Criti	Acute critical effects are necrosis and inflamation of the nasal cavity. Critical Study: Muse et al. 1995	995										
hronic critical effects	s are edema of I	ungs and emphyse	ema. Critical Stu	*Chronic critical effects are edema of lungs and emphysema. Critical Study. Muse et al. 1995											
												_			

Attachment H: TPA Smoke Pots

Bald eagle risk characterization for TPA exposure under Pasquill Category B.

PA Smoke Pot														
										-			-	
	Distance (m)	Daily Acute Intake Value (g/m²) Value (g/kg-day)	Daily Chronic Intake "Acute To	*Acute Toxicity	Toxicity Value	Acute TRV Uncertainty	Chronic TRV Uncertainty	Acute TRV	Chronic	Chronic Dose Adjusted TRV	Acute Hazard	Chronic Hazard	Acute	Chronic
			16.2	21	(8)	Adjustment	Adjustment	_	TRV (g/m²)	(g/kg-day)	Quotient	_	Effect	Effect
Vinter Inhalation													-	
	3000	9.0E+00	1 35.08	30										
	4000		7 15 40	0.0	9.6		096	2.7E-01	9.0E-03	3.0E-06	3.3E+01	4.2E-01	Yes	S
	2000		7.10-10	8.0	8.6	32	096	2.7E-01	9.0E-03	3.0E-06	1.9E-02	2.4E-04	ž	Ž
	5000		2.8E-10	9.8	8.6	32	096	2.7E-01	9.0E-03	3.0E-06	7.4E-03	9.4E-05	2	2
	2000		1.4E-10	9.6	8.6	32	096	2.7E-01	9.0E-03	3.0E-06	3.7E-03	4.7E-05	2	2
	0009		2 05 44	0.0	9.6	32	096	2.7E-01	9.0E-03	3.0E-06	1.9E-03	2.4E-05	Š	2
	7000		4 4E 44	0.0	9.6	32	096	2.7E-01	9.0E-03	3.0E-06	7.4E-04	9.4E-06	ટ	ž
				8.0	8.6	32	096	2.7E-01	9.0E-03	3.0E-06	3.7E-04	4.7E-06	2	ટ
Acute critical effects are n	ecrosis and i	cute critical effects are necrosis and inflamation of the nasal cavity. Critical Study: Muse et al. 1995	al Study Muse et al. 10	95										
Chronic critical effects ar	e edema of l	tronic critical effects are edema of lungs and emphysema. Critical Study: Muse et al. 1995	ly: Muse et al 1995					1						
													_	
								_		-	_			

Attachment H: Titanium Dioxide Grenades

Bald eagle risk characterization for titanium dioxide exposure under Pasquill Category E.

	_	_	_				-							
	Distance (m)	Dally Acute Intake Value Dally Chronic Intake 'Acute Toxicity (g/m³) Value (g/kg-day) Value (g/kg-day)	Dally Chronic Intake Value (g/kg-day)	*Acute Toxicity Value (g/m³)	**Chronic Toxicity Value	Acute TRV Uncertainty Adjustment	Chronic TRV Uncertainty	Acute TRV	Chronic	Chronic Dose Adjusted TRV	Acute Hazard	Chronic Hazard	Acute	Chronic
							Windless of the state of the st	- -	M/B) AM	(g/kg-day)	Quotient	Quotient	Effect	Effect
Summer Inhalation														
	100	1.0E-02	1.0E-10	0.25	0.25		0	20.00	20,					
	300		5.0E-11	0.25			000	2.35-01	1.0E-03	5.3E-07	4.0E-02	1.9E-04	2	Š
	200		2.0E-11	0.25		- -	100	2.3E-01	1.65-03	5.3E-07	2.0E-02	9.5E-05	2	Š
	200	1.0E-03	1 0F-11	0.25			2 :	7.55-01	1.6E-03	5.3E-07	8.0E-03	3.8E-05	°Z	Š
	1000		5 OF 12	20.0		-	160	2.5E-01	1.6E-03	5.3E-07	4.0E-03	1.9E-05	2	Š
*** **** ** ** ************************	1400		21-70.0	67.0		-	160	2.5E-01	1.6E-03	5.3E-07	2.0E-03	9.5E-06	2	2
	1800	-	2.0E-12	CZ.0		-	160	2.5E-01	1.6E-03	5.3E-07	8.0E-04	3.8E-06	2	SN
			1.05-12	0.25	0.25	-	160	2.5E-01	1.6E-03	5.3E-07	4.0E-04	1.9E-06	2	S
*Acute toxicity value as:	sumed equal to	*Acute toxicity value assumed equal to unadjusted chronic LOAEL. Acute critical effects are respiratory	. Acute critical effects	are respiratory irrita	irritation. Critical Study: Lewis 1992	r. Lewis 1992			!					
*Chronic critical effects	are respirator,	*Chronic critical effects are respiratory irritation. Critical Study: Lewis 1992	ewis 1992						+					
		Daily A cotto led of the C		1	**Chronic	Acute TRV	Chronic TRV	Acute		Chronic Dose	Acute	Chronic		
	UISTANCE (m)	(g/m³) (g/m³) (g/m³) (g/m³)	Daily Chronic Intake Value (g/kg-day)	*Acute Toxicity Value (g/m³)	Toxicity Value (q/m³)	Uncertainty	Uncertainty	TRV (a/m³,	Chronic	Adjusted TRV	Hazard	Hazard	Acute	Chronic
Winter Inhalation								1		(g/kg-day)	duotient	Quotient	Effect	Effect
	1001	1 OE.02	7.05.44			!								
	300	<u> </u>	3 65 44	0.20	0.25	-	160	2.5E-01	1.6E-03	5.3E-07	4.0E-02	1.4E-04	2	8
	200		3.0E-11	0.20	0.25	-	160	2.5E-01	1.6E-03	5.3E-07	2.0E-02	6.8E-05	2	S
	2007		7 25 42	0.25	0.25	-	160	2.5E-01	1.6E-03	5.3E-07	8.0E-03	2.7E-05	S	2
100000	1000	-	2 5 5 7 40	0.20	0.25		160	2.5E-01	1.6E-03	5.3E-07	4.0E-03	1.4E-05	2	2
	1400	205 04	21-20.6	0.25	0.25	-	160	2.5E-01	1.6E-03	5.3E-07	2.0E-03	6.8E-06	S N	S S
	200	2.05-04	1.4E-12	0.25	0.25	-	160	2.5E-01	1.6E-03	5.3E-07	8 OF-04	2 7F-06	2	2
	0001	1.0E-04	7.2E-13	0.25	0.25	-	160	2.5E-01	1.6E-03	5.3E-07	4.0E-04	1.4F-06	2 2	2 2
1-													2	
Acute toxicity value ass	umed equal to	Acute toxicity value assumed equal to unadjusted chronic LOAEL. Acute critical effects are respiratory	. Acute critical effects a		rritation. Critical Study: Lewis 1992	: Lewis 1992								
Chronic critical effects	are respiratory	Chronic critical effects are respiratory irritation. Critical Study: Lewis 1992	ewis 1992											
								-	_		-	_	_	-

Attachment I Threshold Values for Titanium Dioxide, Terephthalic Acid, and Fog Oil

TABLE I-1. TIO₂ threshold values for Indiana bats, gray bats, and bald eagles.

Receptor Activity	Time of Year	Effect	Distance/ Location of Effect	Threshold Value
Foraging & roosting Indiana bats		None		521
Hibernating Indiana bats		None		388
Gray bats		None		
Bald eagles		None		

TABLE I-2. TPA grenade threshold values for Indiana bats, gray bats, and bald eagles.

THE THE PARTY OF THE PROPERTY OF THE PARTY O

Receptor Activity	Time of Year	Effect	Distance/ Location of Effect	Threshold Value
Foraging & roosting Indiana bats	1 May through 31 August	Acute Inhalation	Within 3000 m of 22 TAs	0
Ilidiana Date				
Foraging & roosting Indiana bats	1 May through 31 August	Chronic Inhalation	Within 3000 m of 22 TAs	105
IIIdiana bate				
Hibernating Indiana bats	1 September through 30 April	Acute Inhalation	Davis No. 2 and Joy from Sapper TA, Joy Cave from Range 28 Wolf Den from TA243, TA238, and Road Brooks from TA125, TA194	0
Hibernating Indiana bats	1 September through 30 April	Chronic Inhalation	Davis No. 2 and Joy from Sapper TA, Joy Cave from Range 28 Wolf Den from TA243, TA238, and Road Brooks from TA125, TA194	105

TABLE I-2. Continued.

		· · · · · · · · · · · · · · · · · · ·		
Receptor Activity	Time of Year	Effect	Distance/ Location of Effect	Threshold Value
Foraging gray bats	1 April through 31 October, 1 hr before sunset to 1 hr after sunrise	Acute Inhalation	Within 3000 m of any of the 22 TAs	0
Foraging gray bats	1 April through 31 October, 1 hr before sunset to 1 hr after sunrise	Chronic Inhalation	Within 3000 m of any of the 22 TAs	120
Gray bats in maternity caves	1 April through 31 October	Acute Inhalation	Saltpeter No. 3 from Sapper TA	0
Gray bats in maternity caves	1 April through 31 October	Chronic Inhalation	Saltpeter No. 3 from Sapper TA	120

Homework Confidence (Inc.)

* 300

TABLE I-2. Continued.

1996,280,000 - 1997

Receptor Activity	Time of Year	Effect	Distance/ Location of Effect	Threshold Value
Traveling bald eagles	1 November through 15 March	Acute Inhalation	Within 3000 m of any of the 22 TAs	0
Perching bald eagles	1 November through 15 March	Chronic Inhalation	Roubidoux Creek from TA 240S, TA 241, R 28, TA 234, Sapper TA, Road Big Piney River from TA 126, TA 125, TA 194	2242
Nesting bald eagles	-	None		

TABLE I-3. TPA smoke pots threshold values for Indiana bats, gray bats, and bald eagles.

Receptor Activity	Time of Year	Effect	Distance/ Location of Effect	Threshold Value
Foraging & roosting Indiana bats	1 May through 31 August	Acute Inhalation	Within 3000 m of 9 TAs	0
Foraging & roosting Indiana bats	1 May through 31 August	Chronic Inhalation	Within 3000 m of 22 TAs	107
Hibernating Indiana bats	1 September through 30 April	Acute Inhalation	Davis No. 2 and Joy from Mush Paddle & Bailey McCann Wolf Den from R33	0
Hibernating Indiana bats	1 September through 30 April	Chronic Inhalation	Davis No. 2 and Joy from Mush Paddle & Bailey McCann Wolf Den from R33	79
Foraging gray bats	1 April through 31 October, 1 hr before sunset to 1 hr after sunrise	Acute Inhalation	Within 3000 m of any of the 9 TAs	0
Foraging gray bats	1 April through 31 October, 1 hr before sunset to 1 hr after sunrise	Chronic Inhalation	Within 3000 m of any of the 9 TAs	120
Gray bats in maternity caves	1 April through 31 October	Acute inhalation	Saltpeter No. 3 from Mush Paddle, Bailey McCann	0
Gray bats in maternity caves	1 April through 31 October	Chronic inhalation	Saltpeter No. 3 from Mush Paddle, Bailey McCann	120

一种,并不是一个主要的现在分词,有意思的不知的心,也是可能能够就能能够随着

TABLE I-3. Continued.

The second of th

Receptor Activity	Time of Year	Effect	Distance/ Location of Effect	Threshold Value
Traveling bald eagles	1 November through 15 March	Acute Inhalation	Within 3000 m of any of the 9 TAs	0
Perching bald eagles	1 November through 15 March	Chronic Inhalation	Roubidoux Creek from Mush Paddle, Bailey McCann, Musgrave, FP6, & R28	1114
Nesting bald eagles		None		

TABLE I-4. Quantity of fog oil used in the determination of effects to Indiana bats, gray bats, and bald eagles for the RCP Alternative. Annual consumption of fog oil for static is 20,000 gallons and mobile training is 105,500 gallons. The percent of time (gallons) each mobile smoke training area will be used is provided.

			Sallons of Fog C	Dil	
Receptor Activity	Static	Ballard Hollow (20%)	Cannon Range (Mush Paddle Hollow) (25%)	Musgrave Hollow (40%)	Bailey/ McCann Hollow (30%)
Hibernating Indiana bats	20,000	21,100	26,375	42,200	31,650
Foraging/ roosting Indiana bats	20,000	42,200	42,200	42,200	42,200
Gray bats in maternity caves	20,000	21,100	26,375	42,200	31,650
Foraging Gray bats	20,000	42,200	42,200	42,200	42,200
Traveling Bald Eagles	20,000	42,200	42,200	42,200	42,200
Perching Bald Eagles	20,000	42,200	42,200	42,200	42,200
Nesting Bald Eagles	20,000	42,200	42,200	42,200	42,200

TABLE I-5. Quantity of fog oil used in the determination of effects to Indiana bats, gray bats, and bald eagles for the OPTM Alternative. Annual consumption of fog oil for static is 8,500 gallons and for mobile training is 76,000 gallons. The percent of time (gallons) each mobile smoke training area will be used is provided.

		G	Sallons of Fog C	il	
Receptor Activity	Static	Ballard Hollow (20%)	Cannon Range (Mush Paddle Hollow) (25%)	Musgrave Hollow (40%)	Bailey/ McCann Hollow (30%)
Hibernating Indiana bats	8500	15,200	19,000	30,400	22,800
Foraging/ roosting Indiana bats	8500	30,400	30,400	30,400	30,400
Gray bats in maternity caves	8500	15,200	19,000	30,400	22,800
Foraging Gray bats	8500	30,400	30,400	30,400	30,400
Perching & Traveling Bald Eagles	8500	30,400	30,400	30,400	30,400
Perching Bald Eagles	8500	30,400	30,400	30,400	30,400
Nesting Bald Eagles	8500	30,400	30,400	30,400	30,400

TABLE I-6. Quantity of fog oil used in the determination of effects to Indiana bats, gray bats, and bald eagles for the EPTM Alternative. Annual consumption of fog oil for static is 500 gallons and mobile training is 49,000 gallons. The percent of time (gallons) each mobile smoke training area will be used is provided.

		G	allons of Fog O	il	
Receptor Activity	Static	Ballard Hollow (20%)	Cannon Range (Mush Paddie Hollow) (25%)	Musgrave Holiow (40%)	Bailey/ McCann Hollow (30%)
Hibernating Indiana bats	500	9800	12,250	19,600	14,700
Foraging/ roosting Indiana bats	500	19,600	19,600	19,600	19,600
Gray bats in maternity caves	500	9800	12,250	19,600	14,700
Foraging gray bats	500	19,600	19,600	19,600	19,600
Traveling bald eagles	500	19,600	19,600	19,600	19,600
Perching bald eagles	500	19,600	19,600	19,600	19,600
Nesting bald eagles	500	19,600	19,600	19,600	19,600

TABLE I-7. Effects predicted for foraging and roosting summer Indiana bats from RCP, OPTM, and EPTM Training Alternatives based on percentage of use on mobile TAs.

Receptor Activity	Effect Based on Percent Use	Pasquill Category	Dista	ance of Effec	t (m)
			RCP	OPTM	EPTM
Foraging/ roosting	Chronic Inhalation	В	4000	4000	4000
		C	3500	3000	3000
,		D	6000	4500	3000
	,	E	10,000	7000	4000

TABLE I-8. Effects predicted for hibernating winter Indiana bats from RCP, OPTM, and EPTM Training Alternatives based on percentage of use on mobile fog oil TAs.

Mobile Fog Oil Training Area	Pasquill Category	Hib	ernacula Affe	cted
		RCP	OPTM	EPTM
Musgrave Hollow	B, C, D, and E	None	None	None
Cannon Range (Mush	В	Davis No.	Davis No.2	Davis No.2
Paddle Hollow)		2 and Joy	and Joy	and Joy
	С	Davis No.2	Davis No.2	Davis No.2
		and Joy	and Joy	and Joy
	D	Davis No.2	Davis No.2	Davis No.2
		and Joy	and Joy	and Joy
	E	Davis No.2	Davis No.2	Davis No.2
		and Joy	and Joy	and Joy
Bailey McCann Hollow	В	Davis No.2	Davis No.2	Davis No.2
		Wolf Den,	Wolf Den,	Wolf Den,
		and Joy	and Joy	and Joy
	С	Davis No.2	Davis No.2	Davis No.2
		and Joy	and Joy	and Joy
	D	Davis No.2	Davis No.2	Davis No.2
		and Joy	and Joy	and Joy
	E	Davis No.2	Davis No.2	Davis No.2
		Wolf Den,	Wolf Den,	Wolf Den,
		and Joy	and Joy	and Joy
Ballard		None	None	None

TABLE I-9. Effects predicted for foraging gray bats from RCP, OPTM, and EPTM Training Alternatives based on percentage of use on mobile fog oil TAs.

Receptor Activity	Effect Based on Percent Use	Pasquill Category	Dista	ance of Effec	et (m)
			RCP	OPTM	EPTM
Foraging	Chronic Inhalation	В	4000	4000	4000
i oraging					
İ		С	3000	3000	3000
		D	4500	4500	3000
		Е	7000	7000	4000
	ļ				

TABLE I-10. RCP, OPTM, and EPTM Training Alternatives chronic inhalation effects to gray bats in maternity colonies in caves based on percentage of use at each mobile fog oil TA.

Mobile Fog Oil Training Area	Pasquill Category	Cave Affected		
	,	RCP	OPTM	EPTM
Musgrave Hollow	В	Saltpeter No. 3	Saltpeter No. 3	None
	С	Saltpeter No. 3	None	None
:	D	None	None	None
	E	Saltpeter No. 3	None	None
Cannon Range (Mush Paddle Hollow)	В	Saltpeter No. 3	Saltpeter No. 3	Saltpeter No. 3
	C	Saltpeter No. 3	Saltpeter No. 3	Saltpeter No. 3
	D	None	None	None
	E	Saltpeter No. 3	None	None
Bailey/McCann Hollow	В	Saltpeter No. 3	Saltpeter No. 3	Saltpeter No. 3
	С	Saltpeter No. 3	Saltpeter No. 3	Saltpeter No. 3
	D	None	None	None
	E	Saltpeter No. 3	None	None
Ballard Hollow	B, C, D. & E	None	None	None

Attachment J Stressor Intake and Risk Characterization Sensitive Life Stages for Indiana Bats, Gray Bats, and Bald Eagles

RISK PARAMETERS FOR INDIANA BATS

Summer Foraging/Roosting Inhalation

Parameter	Abbreviation	Definition '
Distance		Number of meters from chemical source to exposure point.
Daily Acute Intake Value		Amount of stressor taken in by the receptor per day.
Daily Chronic Intake Value		Amount of stressor taken in by the receptor, averaged over its lifetime, per day.
Acute Toxicity Value		Single chemical exposure.
Chronic Toxicity Value		Chemical exposure averaged over the receptor's lifetime.
Acute Toxicity Reference Value Uncertainty Adjustment	Acute TRV Uncertainty Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological differences between test species and species of concern (receptors).
Chronic Toxicity Reference Value Uncertainty Adjustment	Chronic TRV Uncertainty Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological differences between test species and species of concern (receptors), averaged over the receptor's lifetime.
Acute Toxicity Reference Value	Acute TRV	Adjusted (with uncertainty factors) toxicological reference values used as measurement endpoints. A TRV was developed for each receptor.
Chronic Toxicity Reference Value	Chronic TRV	Adjusted (with uncertainty factors) toxicological reference values used as measurement endpoints, averaged over the receptors lifetime. A TRV was developed for each receptor.
Chronic Dose Adjusted Toxicity Reference Value	Chronic Dose Adjusted TRV	A toxicological value adjusted by multiplicative uncertainty factors for chronic (averaged over the receptor's lifespan) exposure.
Acute Hazard Quotient		Equal to expected exposure concentration acute divided by TRVacute.
Chronic Hazard Quotient	-	Equal to daily intake chronic divided by TRV chronic.
Acute Effect		Acute Effect = yes, if Acute Hazard Quotient>1. Acute Effect = no, if Acute Hazard Quotient <1.
Chronic Effect		Chronic Effect = yes, if Chronic Hazard Quotient>1. Chronic Effect = no, if Chronic Hazard Quotient<1.

RISK PARAMETERS FOR GRAY BATS

Summer Foraging Inhalation

Parameter	Abbreviation	Definition
, Distance		Number of meters from chemical source to exposure point.
Daily Acute Intake Value		Amount of stressor taken in by the receptor per day.
Daily Chronic Intake Value		Amount of stressor taken in by the receptor, averaged over its lifetime, per day.
Acute Toxicity Value		Single chemical exposure.
Chronic Toxicity Value		Chemical exposure averaged over the receptor's lifetime.
Acute Toxicity Reference Value Uncertainty Adjustment	Acute TRV Uncertainty Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological differences between test species and species of concern (receptors).
Chronic Toxicity Reference Value Uncertainty Adjustment	Chronic TRV Uncertainty Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological differences between test species and species of concern (receptors), averaged over the receptor's lifetime.
Acute Toxicity Reference Value	Acute TRV	Adjusted (with uncertainty factors) toxicological reference values used as measurement endpoints. A TRV was developed for each receptor.
Chronic Toxicity Reference Value	Chronic TRV	Adjusted (with uncertainty factors) toxicological reference values used as measurement endpoints, averaged over the receptors lifetime. A TRV was developed for each receptor.
Chronic Dose Adjusted Toxicity Reference Value	Chronic Dose Adjusted TRV	A toxicological value adjusted by multiplicative uncertainty factors for chronic (averaged over the receptor's lifespan) exposure.
Acute Hazard Quotient		Equal to expected exposure concentration _{acute} divided by TRV _{acute} .
Chronic Hazard Quotient		Equal to daily intakechronic divided by TRVchronic.
Acute Effect		Acute Effect = yes, if Acute Hazard Quotient>1. Acute Effect = no, if Acute Hazard Quotient <1.
Chronic Effect		Chronic Effect = yes, if Chronic Hazard Quotient>1. Chro Effect = no, if Chronic Hazard Quotient<1.

Maternity Cave Inhalation

Parameter	Abbreviation	Definition
Distance		Number of meters from chemical source to exposure point.
Daily Acute Intake Value		Amount of stressor taken in by the receptor per day.
Daily Chronic Intake Value		Amount of stressor taken in by the receptor, averaged over its lifetime, per day.
Acute Toxicity Value		Single chemical exposure.
Chronic Toxicity Value		Chemical exposure averaged over the receptor's lifetime.
Acute Toxicity Reference Value Uncertainty Adjustment	Acute TRV Uncertainty Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological differences between test species and species of concern (receptors).
Chronic Toxicity Reference Value Uncertainty Adjustment	Chronic TRV Uncertainty Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological differences between test species and species of concern (receptors), averaged over the receptor's lifetime.
Acute Toxicity Reference Value	Acute TRV	Adjusted (with uncertainty factors) toxicological reference values used as measurement endpoints. A TRV was developed for each receptor.
Chronic Toxicity Reference Value	Chronic TRV	Adjusted (with uncertainty factors) toxicological reference values used as measurement endpoints, averaged over the receptors lifetime. A TRV was developed for each receptor.
Chronic Dose Adjusted Toxicity Reference Value	Chronic Dose Adjusted TRV	A toxicological value adjusted by multiplicative uncertainty factors for chronic (averaged over the receptor's lifespan) exposure.
Acute Hazard Quotient		Equal to expected exposure concentration $_{acute}$ divided by TRV_{acute} .
Chronic Hazard Quotient		Equal to daily intakechronic divided by TRVchronic.
Acute Effect		Acute Effect = yes, if Acute Hazard Quotient>1. Acute Effect = no, if Acute Hazard Quotient <1.
Chronic Effect		Chronic Effect = yes, if Chronic Hazard Quotient>1. Chronic Effect = no, if Chronic Hazard Quotient<1.

RISK PARAMETERS FOR BALD EAGLES

Summer Foraging Inhalation

Parameter	Abbreviation	Definition
Distance		Number of meters from chemical source to exposure point.
Daily Acute Intake Value		Amount of stressor taken in by the receptor per day.
Daily Chronic Intake Value		Amount of stressor taken in by the receptor, averaged over its lifetime, per day.
Acute Toxicity Value		Single chemical exposure.
Chronic Toxicity Value		Chemical exposure averaged over the receptor's lifetime.
Acute Toxicity Reference Value Uncertainty Adjustment	Açute TRV Uncertainty Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological differences between test species and species of concern (receptors).
Chronic Toxicity Reference Value Uncertainty Adjustment	Chronic TRV Uncertainty Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological differences between test species and species of concern (receptors), averaged over the receptor's lifetime.
Acute Toxicity Reference Value	Acute TRV	Adjusted (with uncertainty factors) toxicological reference values used as measurement endpoints. A TRV was developed for each receptor.
Chronic Toxicity Reference Value	Chronic TRV	Adjusted (with uncertainty factors) toxicological reference values used as measurement endpoints, averaged over the receptors lifetime. A TRV was developed for each receptor.
Chronic Dose Adjusted Toxicity Reference Value	Chronic Dose Adjusted TRV	A toxicological value adjusted by multiplicative uncertainty factors for chronic (averaged over the receptor's lifespan) exposure.
Acute Hazard Quotient		Equal to expected exposure concentration acute divided by TRV acute.
Chronic Hazard Quotient		Equal to daily intakechronic divided by TRVchronic.
Acute Effect		Acute Effect = yes, if Acute Hazard Quotient>1. Acute Effect = no, if Acute Hazard Quotient <1.
Chronic Effect		Chronic Effect = yes, if Chronic Hazard Quotient>1. Chronic Effect = no, if Chronic Hazard Quotient<1.

Summer Foraging Ingestion

Parameter	Abbreviation	Definition
Distance		Number of meters from chemical source to exposure point.
Daily Acute Intake Value		Amount of stressor taken in by the receptor per day.
Daily Chronic Intake Value		Amount of stressor taken in by the receptor, averaged over its lifetime, per day.
Acute Toxicity Value		Single chemical exposure.
Chronic Toxicity Value	_	Chemical exposure averaged over the receptor's lifetime.
Acute Toxicity Reference Value Uncertainty Adjustment	Acute TRV Uncertainty Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological differences between test species and species of concern (receptors).
Chronic Toxicity Reference Value Uncertainty Adjustment	Chronic TRV Uncertainty Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological differences between test species and species of concern (receptors) averaged over the receptor's lifetime.
Acute Toxicity Reference Value	Acute TRV	Adjusted (with uncertainty factors) toxicological reference values used as measurement endpoints. A TRV was developed for each receptor.
Chronic Toxicity Reference Value	Chronic TRV	Adjusted (with uncertainty factors) toxicological reference values used as measurement endpoints, averaged over the receptors lifetime. A TRV was developed for each receptor.
Acute Hazard Quotient		Equal to expected exposure concentration acute divided by TRV acute.
Chronic Hazard Quotient		Equal to daily intake _{chronic} divided by TRV _{chronic} .
Acute Effect		Acute Effect = yes, if Acute Hazard Quotient>1. Acute Effect no, if Acute Hazard Quotient <1.
Chronic Effect		Chronic Effect = yes, if Chronic Hazard Quotient>1. Chronic Effect = no, if Chronic Hazard Quotient<1.

RISK PARAMETERS FOR BALD EAGLES

Summer Foraging Dermal Absorption

Parameter	Abbreviation	Definition
Distance		Number of meters from chemical source to exposure point.
Daily Acute Intake Value		Amount of stressor taken in by the receptor per day.
Skin Surface Area		Surface area of receptor.
Dermaily Absorbed Dose		Amount of chemical stressor dermally absorbed by receptor.
Acute Toxicity Value	7	Single chemical exposure.
Chronic Toxicity Value		Chemical exposure averaged over the receptor's lifetime.
Acute Toxicity Reference Value Uncertainty Adjustment	Acute TRV Uncertainty Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological differences between test species and species of concern (receptors).
Chronic Toxicity Reference Value Uncertainty Adjustment	Chronic TRV Uncertainty Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological differences between test species and species of concern (receptors), averaged over the receptor's lifetime.
Acute Toxicity Reference Value	Acute TRV	Adjusted (with uncertainty factors) toxicological reference values used as measurement endpoints. A TRV was developed for each receptor.
Chronic Toxicity Reference Value	Chronic TRV	Adjusted (with uncertainty factors) toxicological reference values used as measurement endpoints, averaged over the receptors lifetime. A TRV was developed for each receptor.
Acute Hazard Quotient		Equal to expected exposure concentration divided by TRV cute.
Chronic Hazard Quotient		Equal to daily intake chronic divided by TRV chronic.
Acute Effect		Acute Effect = yes, if Acute Hazard Quotient>1. Acute Effect = no, if Acute Hazard Quotient <1.
Chronic Effect		Chronic Effect = yes, if Chronic Hazard Quotient>1. Chronic Effect = no, if Chronic Hazard Quotient<1.

Maternity Cave Inhalation

Parameter	Abbreviation	Definition
Distance		Number of meters from chemical source to exposure point.
Daily Acute Intake Value		Amount of stressor taken in by the receptor per day.
Daily Chronic Intake Value		Amount of stressor taken in by the receptor, averaged over its lifetime, per day.
Acute Toxicity Value		Single chemical exposure.
Chronic Toxicity Value		Chemical exposure averaged over the receptor's lifetime.
Acute Toxicity Reference Value Uncertainty Adjustment	Acute TRV Uncertainty Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological differences between test species and species of concern (receptors).
Chronic Toxicity Reference Value Uncertainty Adjustment	Chronic TRV Uncertainty Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological differences between test species and species of concern (receptors), averaged over the receptor's lifetime.
Acute Toxicity Reference Value	Acute TRV	Adjusted (with uncertainty factors) toxicological reference values used as measurement endpoints. A TRV was developed for each receptor.
Chronic Toxicity Reference Value	Chronic TRV	Adjusted (with uncertainty factors) toxicological reference values used as measurement endpoints, averaged over the receptors lifetime. A TRV was developed for each receptor.
Chronic Dose Adjusted Toxicity Reference Value	Chronic Dose Adjusted TRV	A toxicological value adjusted by multiplicative uncertainty factors for chronic (averaged over the receptor's lifespan) exposure.
Acute Hazard Quotient		Equal to expected exposure concentration _{acute} divided by TRV _{acute} .
Chronic Hazard Quotient		Equal to daily intake chronic divided by TRV chronic.
Acute Effect		Acute Effect = yes, if Acute Hazard Quotient>1. Acute Effect = no, if Acute Hazard Quotient <1.
Chronic Effect		Chronic Effect = yes, if Chronic Hazard Quotient>1. Chronic Effect = no, if Chronic Hazard Quotient<1.

RISK PARAMETERS FOR BALD EAGLES

Maternity Cave Dermal Absorption

Parameter	Abbreviation	Definition
Distance		Number of meters from chemical source to exposure point.
Daily Acute Intake Value		Amount of stressor taken in by the receptor per day.
Skin Surface Area		Surface area of receptor.
Dermally Absorbed Dose		Amount of chemical stressor dermally absorbed by receptor.
Acute Toxicity Value		Single chemical exposure.
Chronic Toxicity Value		Chemical exposure averaged over the receptor's lifetime.
Acute Toxicity Reference Value Uncertainty Adjustment	Acute TRV Uncertainty Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological differences between test species and species of concern (receptors).
Chronic Toxicity Reference Value Uncertainty Adjustment	Chronic TRV Uncertainty Adjustment	Multiplicative factors applied to toxicological values to account for uncertainty in morphological and physiological differences between test species and species of concern (receptors) averaged over the receptor's lifetime.
Acute Toxicity Reference Value	Acute TRV	Adjusted (with uncertainty factors) toxicological reference values used as measurement endpoints. A TRV was developed for each receptor.
Chronic Toxicity Reference Value	Chronic TRV	Adjusted (with uncertainty factors) toxicological reference values used as measurement endpoints, averaged over the receptors lifetime. A TRV was developed for each receptor.
Acute Hazard Quotient		Equal to expected exposure concentration _{acute} divided by TRV _{acute} .
Chronic Hazard Quotient		Equal to daily intake divided by TRV chronic-
Acute Effect		Acute Effect = yes, if Acute Hazard Quotient>1. Acute Effect no, if Acute Hazard Quotient <1.
Chronic Effect		Chronic Effect = yes, if Chronic Hazard Quotient>1. Chron Effect = no, if Chronic Hazard Quotient<1.

Attachment J: Fog Oil - Nursing Indiana Bats

Mobile Smoke								1			Y	Propin		
					Chronic	Acute TRV	Chronic IKV	Acute	-	בוווסווור הספם	1	7.01		Chronic
	Distance		Dally Chronic Intake	*Acute Toxicity Toxicity Value	Toxicity Value	Uncertainty	Uncertainty	ΙΚ. 	Chronic	Adjusted TRV	Mazard	Hazard	שניים ב	
	()	Daily Acute Intake Value (g/m³) Value (g/kg-day)	Value (g/kg-day)	Value (g/m³)	(g/m³)	Adjustment	Adjustment	(a/m²)	TRV (g/m²)	(g/kg-day)	Quotient	Guorient		בוופגו
													+	
										_			_	
Summer Foraging/Roosting Inhalation	ting Inhalation					!	100	00.100	П	2 45 07	2 7E.03	R 7F-02	Š	S.
	2000	1 0E-02	1.8E-08	8	0.1	16	1001		- 1	Z. 1L-U	2.15			
	3		00 30 0	2	10	16	160	3.8E+00	6.3E-04	2.1E-07	1.3E-03	4.4E-02	2	2
	4000		9.25-03	8		4	160	1	6.3E-04	2.1E-07	5.3E-04	1.7E-02	ş	ž
	2000) 2.0E-03	3.7E-09	90		2	201	ı	1	10 40	27.0	8 7E-03	Ş	Ž
	0000	4 05 03	1 AF-09	09		9	160	3.85+00	6.3E-04	Z.1E-0/	2.15-04	20	:	
	2000		4 100		-	£	160	3.8E+00	6.3E-04	2.1E-07	1.3E-04	4.4E-03	S S	2
	16000	5.0E-04	9.2E-10	3			007	ı	AO 30 A	2 4E_07	5.35.05	1.7E-03	2	ž
	30000	2.05-04	3.7E-10	9	1.0	2	200	Ţ	2.01	10 11 11	1	0 75	2	2
	20000		1.8E-10	99	0.1	91	160	3.8E+00	6.3E-04	2.1E-0/	Z./E-U3	0.70	2	2
	3													
													_	
*Acute critical effect is or	il pneumonta.	*Acute critical effect is oil pneumonta. Critical Study: Shinn et al. 1987												
**Chronic critical effects	are minor les	**Chonic critical effects are minor lesions of the heart. Ilver and lungs. Critical Study: Driver	initical Study: Driver et a	et al. 1992										
CHIQUE CHECK CHOCK							_							

Static Sinone													-	
	Distance		Dally Chronic Intake	*Acute Toxicity	-	Acute TRV Uncertainty	Chronic TRV Uncertainty	Acute	Chronic	Chronic Dose	Acute	Chronic	4	l di
	Ξ	Dally Acute Intake Value (g/m³) Value (g/kg-day)	n³) Value (g/kg-day)	Value (g/m³)	(g/m³)	Adjustment	Adjustment	(g/m³)	TRV (g/m³)	(g/kg-day)	Quotlent	Quotient		Effect
Summer Foraging/Roosting Inhalation	ting Inhalation										1		+	
	4000	1.0E-02	6.2E-10	60	5	4	180	3 85 100	20 30	10 17 0	20 11	100		
	5000	50 DO 3	C7 L7 C			2	8	١	0.50	Z. IE-U/	Z./E-U3	2.9E-03	ž	2
			3.15-10	9	0.1	16	9	3.8E+00	6.3E-04	2.1E-07	1.3E-03	1 5E-03	Ž	2
	9006	2.0E-03	1.2E-10	9	0.1	16	160	3 8F+00	6.3F-04	2 15.07	l	70 00	2 2	
	14000	1.0E-03	6.2E-11	90		64	00,	t		2. 10-01	3.0	5.45	2	2
	24000		1		5	0	DQ.	- 1	6.3E-04	2.1E-07	2.7E-04	2.9E-04	ž	ž
	7000		3.15-11	60		9	160	3.8E+00	6.3E-04	2 1E-07	1 3F-04	1 5F.04	S	2
	20000	2.0E-04	1.2E-11	9	2	4	160	1	6 25 04	1011	10.10	10.10	2 :	2
	50000+	1 0E-04	47	00		2	3	1	0.30-04	Z. 1E-U/	3.3E-U3	3.9E-U3	No	2
			0.45-12	00	0.1	16	160	3.8E+00	6.3E-04	2.1E-07	2.7E-05	2.9E-05	9 N	2
*Acute critical effect is o	il pneumonia.	*Acute critical effect is oil pneumonia. Critical Study: Shinn et al. 1987							1					
*Chronic critical effects	are minor lesk	"Chronic critical effects are minor lesions of the heart liver and linne. Critical Study. Driver		4000										
		and a second sec		et al. 1992										
										+		1	l	Ī
							,			-				_

Mahile Cmake							nursing pups			
Modific Sillone										
	Distance	Fog Oil Concentration			_					
	Ē	(a/m³)	=	Intake Rate (m3/day)	ay)	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
			Daily IR	Hourly IR	Event IR					
Summer Foracing/Roosting Inhalation	ting Inhalation									
South State of the state of the	3000	001	3.4E-04	1.4E-05	3.5E-05	16.3	0.049	900'0	2555	1.8E-08
	4000		3.4E-04	ľ	3.5E-05	16.3	0.049	0.006	2555	9.2E-09
	2002	2000	3.45-04		3.5E-05	16.3	0.049	900.0	2555	_
	200		3.4F-04		3.5E-05	16.3	0.049	900.0	2555	
	0000		3.4E-04		3.5E-05	16.3	0.049	900.0	2555	
	2000	00000	3.4E-04		3.5E-05	16.3	0.049	0.006	2555	
	20000	0.0001	3.4E-04		3.5E-05	16.3	0.049	0.006	2555	1.8E-10
						L				

Static Smoke							nursing pups			
	Distance	Fog Oll Concentration								Dally Chronic Intake
	(m)	(g/m³)	Ē	Intake Rate (m3/day)	'day)	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	
			Dally IR	Hourly IR	Event IR					
Summer Foraging/Roosting Inhalation	ting Inhalation									
	4000	0.01	3.4E-04	1.4E-05	2.1E-05	0.9	0.049	0.006	2555	6.2E-10
	5000	0.005	3.4E-04	1.4E-05						
	9000	0.002	3.4E-04	1.4E-05		6.0				
	14000	0.001	3.4E-04	1.4E-05						6.2E-11
	24000	0.0005	3.4E-04	1.4E-05	2.1E-05	0.9	0.049	900'0		
	20000	0.0002	3.4E-04	1.4E-05	2.1E-05	0.9	0.049	900'0		
	\$0000¢	0.0001	3.4E-04	1.4E-05	2.1E-05	0.9		900'0		6.7F-12
									-	

Attachment J: Fog Oil - Supplemented Nursing Indiana Bats

static Smoke							supplemented nursing	d nursing		
	Distance	Fog Oil Concentration								
	Ē	(g/m³)	Ĕ	Intake Rate (m3/day)	lay)	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
			Dally IR	Hourly IR	Event IR					
Summer Foraging/Roosting Inhalation	Ing Inhalation				1					
	4000	0.01	3.4E-04	1.4E-05	2.1E-05	6.0	0.074	0.007	2555	
	2000	0.005	3.4E-04	1.4E-05	2.1E-05	6.0	0.074	0.007	2555	
	0006	0.002	3.4E-04	1.4E-05	2.1E-05	6.0	0.074	0.007	2555	
	14000	0.001	3.4E-04	1.4E-05	2.1E-05	6.0	0.074	0.007	2555	
	24000		3.4E-04	1.4E-05	2.1E-05	6.0	0.074	0.007	2555	4.0E-11
	20000		3.4E-04	ľ	2.1E-05	6.0	0.074	0.007	2555	
	+00005	0.0001	3.4E-04	1.4E-05	2.1E-05	6.0	0.074	0.007	2555	8.0E-12

Distance Fog Oil Concentration Investment									
(g/m³) Daily IR 0.01 0.005 0.005 0.001 0.001 0.001 0.0005 0.0002 0.0002 0.0002 0.0002 0.0002 0.0002									Dally Chronic Intake
0.01 0.005 0.002 0.002 0.001 0.0002		_	Intake Rate (m3/day)	(day)	EF (days/yr)	ED (yrs)	BW (kg)	AT (davs)	AT (days) Value (o/kg-day)
0.01 0.005 0.002 0.001 0.0005 0.0002 0.0002		Daily IR	Hourly IR	Event IR					(fan R., R)
0.01 0.005 0.002 0.001 0.0005 0.00002 0.00001	g inhalation			L					
0.005 0.002 0.001 0.0005 0.0002 0.0002		3.4E-0	1.4E-05	3.5F-05	16.3	7200	1000		
0.002 0.001 0.0005 0.0002 0.0001		3.4F.0				1000			
0.001 0.0005 0.0002 0.0001		2 45 0				0.0/4	0.007		
0.000 0.0000 0.0000 0.0000		3.45-0			16.3	0.074	0.007	2555	4.7E-09
0,0005		3.4E-0	1.4E-05	3.5E-05	16.3	0.074	0.007	2555	
0.0002		3.4E-04	1.4E-05	3.5E-05	16.3	0 074			
0.0001		3.4E-04	1.4E-05			0.074			
		3.4E-04				10.00			
						4.0.7		CCC7	2.4E-10

Static Smoke												91000	1	
	Distance		Daily Chronic Intake	*Acute Toxicity	Toxicity Value	Acute TRV Uncertainty	Chronic TRV Uncertainty Adjustment	TRV (a/m³)	Chronic TRV (a/m³)	Adjusted TRV (g/kg-day)	Acute Hazard Quotient	Hazard Quotlent	Acute Effect	Chronic
	Ê	Daily Acute Intake Value (grim)	veine (ging-day)	value (gilli)	(3.16)									
Summer Foraning/Roosting Inhalation	Ing Inhalation		*****					- 1			1			144
	4000	1 0F-02	8.0E-10	09	0.1	16	160	3.8E+00	6.3E-04	2.1E-07	2.7E-03	3.85-03	2	2
	2005	20 30 3	4 OE 10	Ug	0.1	16	160	3.8E+00	6.3E-04	2.1E-07	1.3E-03	1.9E-03	S N	Š
	Onne	9.05-03	01-10-4		5	46	160	1	6.3E-04	2.1E-07	5.3E-04	7.6E-04	9N	ž
	0006	Z.UE-03	01-30:1	8	5	2	200	1	100	2 45 07	70 37 0	2 RE 04	Ž	S
	14000	1.0E-03	8.0E-11	09	0.1	91	Udl	- 1	Ø.3E-U4	7.15-01	2.15-04	2000		O IA
	24000	5.0E.04	4 0F-11	9	0.1	16	160			2.1E-0/	1.35-04	40-3E-04	2	2
	00047	10.00	4 6F-11	9	0.1	16	160	l		2.1E-07	5.3E-05	7.6E-05	S N	2
	20000	4.0E-04	10:			46	160	1	l	2 1E-07	2 7F-05	3.8E-05	å	2
	20000+	1.0E-04	8.0E-12	3	5	2	100	1	2					
Acute critical offect is of	i pneumonia	Acute critical offect is oil pneumonia. Critical Study: Shinn et al. 1987												
"Chronic critical effects	are minor lesk	Chronic critical effects are minor lesions of the heart, liver and lungs. Critical Study: Driver	Critical Study: Driver et	et al. 1992										

Mobile Smoke															
											-	-			
	Distance			Dally Chronic Intake	*Acute Toxicity	**Acute Toxicity Value	Acute TRV	Chronic TRV	Acute	1	Chronic Dose	Acute	Chronic	+	T
	(m)	Dally Acute Intak	e Value (g/m³)	, -	Value (g/m³)	(a/m³)	Adjustment	Adjustment	(m)	Tex (a(n.3,	Adjusted IRV	Hazard	Hazard	Acute	Chronic
										1	(g/ng-day)	Cuotient	Guotient	4	Effect
Summer Foraging/Roosting Inhalation	ting Inhalation														
	3000	1.0E-02	92	2.4F_0R	9	3	9	-	-						
	4000		93	4 2E 08			2 !	OPL	- 1	ļ	2.1E-07	2.7E-03	1.1E-01	Š	ž
	2007		2	20.77	8	5	9	160		6.3E-04	2.1E-07	1.3E-03	5.6E-02	ON	Š
	9000		3	4./E-09	8	0.1	16	160	3.8E+00	6.3E-04	2.1E-07	5.3F-04	2 3F-02	2	2
	OOOOL		83	2.4E-09	09	0.4	16	160	1		2 1E.07	27504	4 40 00	2 4	
	16000	5.0E-04	4	1.2E-09	9	-	4	450	1			7	1.15-02	2	2
	30000	2.0E-04	7	4 7E 40	9		2 3	20	3.00	1	7.1E-0/	1.3E-04	5.6E-03	8	ž
	50000			2, 1, 1	3	5	2	160		6.3E-04	2.1E-07	5.3E-05	2.3E-03	No.	2
			5	7.45-10	09	0.1	16	160	3.BE+00	6.3E-04	2.1E-07	2.7E-05	1.1E-03	No	2
of the contract of the contrac															
Acute critical effect is oil pneumonia. Critical Study: Shinn et al. 1987	pneumonia.	Critical Study: Shin	n et al. 1987		_									-	Ī
**Chronic critical effects are minor lesions of the heart, liver and lungs. Critical Study. Driver et	are minor lesic	ons of the heart, live	r and lungs. Ci		al. 1992									-	
													1	1	

Attachment J: Fog Oil - Nursing Gray Bats

Static Smoke										
	Distance	Fog Oil Concentration								Dally Chronic intake
	Ê	(g/m³)		Intake Rate (m³)	3)	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
			Dally IR	Hourly IR Event IR	Event IR					
Summer Foraging Inhalation	lation	1								
	4000	0.01	3.4E-04	1.4E-05	2.1E-05	6.0	0.055	0.0054	3650	5.4E-10
	2000	0.005	3.4E-04	1.4E-05	2.1E-05	6.0	0.055	0.0054	3650	2.7E-10
	0006	0.002	3.4E-04	1.4E-05	2.1E-05	6.0	0.055	0.0054	3650	1.1E-10
	14000	0.001	3.4E-04	1.4E-05	2.1E-05	6.0	0.055	0.0054	3650	5.4E-11
	24000	0.0005	3.4E-04	1.4E-05	2.1E-05	6.0	0.055	0.0054	3650	
	20000		3.4E-04	1.4E-05	2.1E-05	6.0	0.055	0.0054	3650	1.1E-11
	\$0000÷	0.0001	3.4E-04	1.4E-05	2.1E-05	6.0	0.055	0.0054	3650	

Mobile Smoke								-			
	Distance	Fog Oll Concentration	entration								Daily Chronic Intake
	(E)	(g/m³)	(Intake Rate (m³)	•	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Value (a/ka-dav)
				Dally IR	Hourly IR	Event IR					
Summer Foraging Inhalation	ation										
	3000	0.01		3.4E-04	1.4E-05	3.5E-05	16.3	0.055	0 0054	3650	165.08
	4000	0.005		3.4E-04	1.4E-05			0.055	0.0054	3650	
	7000	0.002		3.4E-04	1.4E-05	3.5E-05		0.055	0.0054	3650	
	10000	0.001		3.4E-04	1.4E-05	3.5E-05		0.055	0.0054	3650	
	16000	0.0005	2	3.4E-04	1.4E-05			0.055	0.0054	3650	
	30000	0.0002	2	3.4E-04	1.4E-05			0.055	0.0054	3650	3.2E-10
	20000	0.0001	_	3.4E-04	1.4E-05	3.5E-05	16.3	0.055	0.0054	3650	1 6F-10
											,

			1						_		,-			
Static Smoke					- AND AND AND AND AND AND AND AND AND AND	Veries TOV	Chronic TRV	Acure		Chronic Dose	Acute	Chronic		
	Distance	Daily Chronic Intak	Daily Chronic Intake	itake "Acute Toxicity Toxicity Value	Toxicity Value	Uncertainty	Uncertainty		Chronic TRV (g/m³)	Adjusted TRV (g/kg-day)	Hazard Quotlent		Acute C Effect	Chronic Effect
	Ê	Daily Acute intake value (g/m)	value (ging day)	value (gille)	(3)			Т						
								1						
Summer Foraging Inhalation	tion						004	37.6	AC 3E 9	2 15-07	2.7E-03	2 6F-03 No	2	
	4000	0.0100	5.4E-10	9	0.1	9	20	0.73	0.0	7	200	110 00 10 1	197	
	2005	0 0020	2.7E-10	09	0.1	9	160	3.75	6.3E-04	2.1E-0/	1.35-03	1.3E-US NO		Ī
	800	00000	1 1E-10	09	0.1	16	160	3.75	6.3E-04	2.1E-07	5.3E-04	5.1E-04 No		Ī
	2006	0700.0	5 AC 44	9	+0	16	160	3.75	6.3E-04	2.1E-07	2.7E-04	2.6E-04 No	2	
	14000	0.00.0	275 44	8 9		4	160	3.75	6.3E-04	2.1E-07	1.3E-04	1.3E-04 No	2	
	24000	6000.0	7.75-11	8 8	5	9	160		6.3E-04	2.1E-07	5.3E-05	5.1E-05 No	No.	
	20000	0.0002	-1	8 3	5	2 4	097		8 3E 04	2 1E-07	2.7E-05	2.6E-05 No	<u>R</u>	
	+00009	0.0001	5.4E-12	09	1.0	9	8	2 6	5	1				
									1					
*Acute critical effect is of	pneumonia.	Acute critical effect is oil pneumonia. Critical Study. Shinn et al. 1987											+	
"Chronic critical effects	are minor lesic	**Chronic critical effects are minor lesions of the heart, liver and lungs. Critical Study: Driver	Critical Study: Driver et a	et al. 1992										

Mobile Smoke															
									-					-	
	Distance (m)	Dally Acute Intake	Value (q/m³)	Dally Acute Intake Value (q/m³) Value (q/kg-dav)	te *Acute Toxicity Toxicity Value	Toxicity Value	Acute TRV Uncertainty	Chronic TRV Uncertainty	Acute TRV	Chronic	Chronic Dose Adjusted TRV	Acute Hazard	+-	Acute	Chronic
						/	Manuschit	Aujustment		IKV (g/m.)	(g/kg-day)	Quotlent	Quotient		Effect
Summer Foraging Inhalation	tion														
	3000	0.0100		1 6F-08	G		19								
	4000	0.0050		8 00 00			2	160	3.75	6.3E-04	2.1E-07	2.7E-03	7.6E-02 No	oN 0	
	7007	00000		50-100			9	160	3.75	6.3E-04	2.1E-07	1.3E-03	3.8E-02 No	δ O	
	10000	0.0020		3.2E-09		0.1	16	160	3.75	6.3E-04	2.1E-07	5.3E-04	1.5E-02 No		
	200	0.000		1.6E-09		0.1	16	160	3.75	6.3E-04	2.1E-07	2.7E-04		T	
	0000	00000		8.0E-10		0.1	16	160	3.75	6.3E-04	2.1E-07	1.3E-04			
	00005	0.0002		3.2E-10		0	16	160	3.75	6.3E-04	2.1E-07	5.3E-05	1.5E-03 No		
		000.0		1.0E-TU	09	0.4	9	160	3.75	6.3E-04	2.1E-07	2.7E-05	7.6E-04 No	2	
*Acute critical effect is oil pneumonia Critical Study: Shinn et al. 1087	pheumonia	Critical Study Shine	7 at al 4087											-	
"Chronic critical offects	are minor lesion	ne of the heart live	C. W. 1307	- 11						_				-	
Chicago chicas are minor teaches of the heart, liver and lungs. Critical Study: Driver e	Diesi Inilia iesia	IIS OF DIE HEARI, IIVE	and lungs. C	w١	al. 1992									-	
				_						T		1	1	+	Ī
										-					_

The second secon

Attachment J: Fog Oil - Supplemented Nursing Gray Bats

atic Smoke						v	supplemented nursing	nursing		
	Distance	Fog Oil Concentration						-		
	Ê	(g/m³)		Intake Rate (m³)	را)	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
			Dally IR	Hourly IR	Event IR					
ummer Foraging Inhalation	ation									
*	4000	0.01	3.4E-04	1.4E-05	2.1E-05	0.9	0.123	0.0071	3650	
	2000		3.4E-04	1.4E-05	2.1E-05	6.0	0.123	0.0071		
	0000		3.4E-04	١.	2.1E-05	6.0	0.123	0.0071	3650	
	14000		3.4E-04			6'0	0.123	0.0071	3650	
	24000		3.4E-04		2.1E-05	6.0	0.123	0.0071	3650	
	20000		3.4E-04		2.1E-05	6.0	0.123	0.0071	3650	
	\$0000÷		3.4E-04			6.0	0.123	0.0071	3650	9.2E-12

Mobile Smoke										
	Distance	Fog Oil Concentration								
	Œ	(g/m³)		intake Rate (m³)	÷2	EF (davs/vr)	ED (vrs)	RW (kg)	AT (desire)	Daily Chronic Intake
			Dally IR	Hourty 18	Evant 10			(Bu)	(can)	value (grag-day)
Summer Foraging Inhalation	ation				Evelli IV					
	3000	500								
	900		3.45-04			16.3	0.123	0.0071	3650	2.7E-08
	200	con.o	3.4E-04	1.45-05	3.5E-05	16.3	0.123	0.0074	2650	4 45 09
	7000	0.002	3.4E-04	1.4E-05				2000	888	00-04-1
	10000	0.00	20 00					0.00.0	ကြလ	5.4E-09
	00000		9.40-04			16.3	0.123	0.0071	3650	2.7E-09
	2000		3.4E-04	1.4E-05	3.5E-05	16.3	0.123	0.0074	3650	1 45 00
	30000	0.0002	3.4E-04	1 4E.05	L			1000	3	.45-03
	50000	*000 0						1,00.0	3650	5.4E-10
	2000	10000	3.4E-04	1.4E-05	3.5E-05	16.3	0.123	0.0071	3650	2.7E-10
							_			

Static Smoke													-	+	T
	Distance (m)	Dally Acute Intake	Value (ofm³)	Daily Chronic Intake Daily Chronic Intake	*Acute Toxicity	Toxicity Value	Acute TRV Uncertainty Adjustment	Chronic TRV Uncertainty Adjustment	TRV (g/m³)	Chronic TRV (g/m³)	Adjusted TRV (g/kg-day)	Hazard Quotlent	Hazard A	Acute C	Chronic Effect
				6.8										+	
Summer Foraging Inhalation	ation													:	
	4000	0.0100		9.2E-10	09	0.1	16	160	3.75	6.3E-04	2.1E-07	2.7E-03	4.4E-03 No	2	
	2000			4.6E-10	9	0.1	16	160	3.75	6.3E-04	2.1E-07		2.2E-03 No		
	0000			1.8E-10	9	0.1	16	160	3.75	6.3E-04	2.1E-07			온	
	14000			9.2E-11		0.1	16	160	3.75	6.3E-04	2.1E-07	2.7E-04		운	
	24000			4.6E-11		0.1	16	160	3.75	6.3E-04	2.1E-07			운	
	50000			1.8E-11	09	0.1	16	160	3.75	6.3E-04	2.1E-07	5.3E-05		ž	
	\$0000+		-	9.2E-12	99	0.1	16	160	3.75	6.3E-04	2.1E-07	2.7E-05	4.4E-05 No	ž	
*Acute critical effect is oil pneumonia. Critical Study: Shinn et al. 1987	il pneumonia.	Critical Study: Shint	n et al. 1987												
*Chronic critical effects are minor lesions of the heart, liver and lungs. Critical Study: Driver	are minor lesic	ons of the heart, liver	and lungs. C	ritical Study: Driver et a	et al. 1992									\dagger	
				_											7

Mobile Smoke												Ī		-	
									-						
	Distance			Dally Chronic Intake	*Acute Toxicity	Toxicity Value	Uncertainty	Chronic TRV	Acute	Chronic	Chronic Dose	Acute	\vdash		
	(E)	Dally Acute Intak	te Value (g/m³)	Dally Acute Intake Value (g/m³) Value (g/kg-day)	Value (g/m³)	(a/m³)	Adlustment	Adhistment	(w/u)	TBV (c/m³)		Hazard	Hazard	Acute	Chronic
									Т	1	ı	duollent	+	_	Effect
Summer Foraging Inhalation	ıtion						1								
	3000	0.0100	8	2 7E_08	9		1								
	AOOA	0,000.0	5	L. T			0	3	3.75	6.3E-04	2.1E-07	2.7E-03	1.3E-01 No	2	
	2001		3	1.4E-U8	8	0.1	16	9	3.75	6.3E-04	2.1E-07	1.3E-03	6.5F-02 No	N	
	000/	0.0020	8	5.4E-09	8	0.1	16	160	3.75	8 3E 04	2 45 07	A 25 04	20 20 0		
	10000	0.0010	2	2 7E-09	09	7.0				3	2.10-01	0.0E-04	Z.0C-UZ IND	2	
	16000	0 0005	3	00 UV +	8	3	2	201	3.75	6.3E-04	2.1E-07	2.7E-04	1.3E-02 No	2	_
	00000		3 2	50-U+-	3	0.1	16	160	3.75	6.3E-04	2.1E-07	1.3E-04	6.5E-03 No	2	
	00000		2013	5.4E-10	8	0.1	16	160	3.75	6.3E-04	2.1E-07	1	2.6F-03 No	2	
	OOOOC	0.0001	5	2.7E-10	9	0.1	16	160	3.75	6.3E-04	2.1E-07	1	1 3F-03 No	2	
					_										
*Acute critical effect is oil pneumonia. Critical Study: Shinn et al. 1987	pneumonia.	Critical Study: Shir	nn et al. 1987												
"Chronic critical effects are minor lesions of the heart, liver and lungs. Critical Study: Driver	are minor lesio	ns of the heart, live	r and lungs. Cr	itical Study: Driver et a	et al 1992										
													_		
			4			_								-	

Attachment J: Fog Oil - Bald Eagle Eggs

Static Smoke											
	Distance	Distance Fog Oil Concentration	tration		,				:		Dermally Absorbed
	(w)	(g/m²)		Skin Surface Area (m²)	Area (m²)	ABS	EF (days/yr) ED (yrs)	ED (yrs)	BW (kg)	AT (days)	Dose (g/kg-day)
Summer Dermal Absorption	tion										
South Nest	20229	0.001		0.0108	80	1	6.0	960.0	0.12	12775	6.2E-10
Mid Nest				0.0108	86	-	6.0	960.0	0.12		6.2E-10
North Nest				0.0108	80	-	6.0	960.0	0.12	12775	

Mobile Smoke									
	Distance	Fog Oil Concentration							Dermally Absorbed
	(E)	(g/m²)	Skin Surface Area (m²)	(m²) ABS	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Dose (g/kg-day)
Summer Dermal Absorption	io								
Musgrave Hollow									
South Nest	25174	0.001	0.0108		1 16.3	960.0	0.12	12775	1.1E-08
Mid Nest	27956	0.001	0.0108		1 16.3	Ì	0.12		
North Nest	48211	0.0005	0.0108		16.3		0.12		
Baily McCann Hollow									
South Nest	19717	0.001	0.0108		1 12.3	0.096	0.12	12775	8.3E-09
Mid Nest	23623	0.001	0.0108		1 12.3	960.0	0.12		
North Nest	44956	0.0004	0.0108		1 12.3	960.0	0.12	12775	
Mush Paddle Hollow									
South Nest	20749	0.001	0.0108		1 10.2	0.096	0.12	12775	6.9E-09
Mid Nest			0.0108		1 10.2		0.12		
North Nest	49712	0.0005	0.0108		1 10.2	960'0	0.12		
Ballard Hollow									
South Nest	17463	0.002	0.0108		1 8.2	960'0	0.12	12775	1.1E-08
Mid Nest	11677	0.002	0.0108		1 8.2	960'0	0.12	12775	
North Nest	34057	0.0005	0.0108		1 8.2		0.12		

Static Smoke												-	Phronic		
	Distance	Dally Acute Intake Value	Skin Surface	Daily Acute Skin Surface Dermally absorbed	*Acute Toxicity	*Acute Toxicity Value	Acute 1KV Uncertainty	Uncertainty	TRV				Hazard	Acute	Chronic
	Ê	(g/m²)	Area (m²)	Area (m²) dose (g/kg-day)	Value (g/kg)	(g/kg)		Adjustment	(g/kg)	Chronic TRV (g/kg)	۲۷ (g/kg)	Quotient	Quotient	Ellect	Eneca
														\dagger	
Summer Dermal Absorption	ion									_				-	
The second second		4 00 00	4 45 65	6 2E-40	2	216	32	320	90.0	6.85	Ş	1.6E-02	9.2E-10	S N	2
South Nest					1 6	9,0		320	90 0	6 RF-01	5	1 6E-02	9.2E-10	2	S
Mid Nest	23638	1.0E-03	1.1E-02		7	017		0.70	3			200	100	92	34
North Nest	45057	5.0E-04	1.1E-02	3.1E-10	- 2	216	32	320	90.0	6.8E-01	Į.	8.UE-U3	4.00-10	2	2
*Acute critical effect is slight to moderate skin irritation. Critical Study. Palmer 1990	oht to modera	te skin irritation. C	Critical Study: Pa	almer 1990											
*Chronic critical effects are well defined erythema and edema. Critical Study: Lewis 1989	are well define	d enythema and ex	dema. Critical S	tudy: Lewis 1989										1	
		-													

Mobile Smoke									-					
		Daily Acute												
	Distance	Intake Value	Skin Surface	Dermaily absorbed	*Acute Toxicity	Toxicity Value	Acute TRV Uncertainty	Chronic TRV	Acute		Acute	Chronic		
	Œ	(g/m²)	Area (m²)	dose (g/kg-day)	Value (g/kg)	(g/kg)	Adjustment	Adjustment	(a/ka)	Chronic TRV (alka)	Hazard Ouotlest	Hazard	Acute	Chronic
										181	1	doorles	Ellect	Ellect
Summer Dermal Absorption	ion						1							
Musgrave Hollow														
South Nest	25174	1.0E-03	1.1E-02	2.4E-08	2	216	33	000	000	10.14.0				
Mid Nest	27956	1.0E-03	1.1E-02	1.1E-08	2		33.5	000	0.0	0.85-01	1.6E-02		2	2
North Nest	48211	5.0E-04		5 5F-00	9		36	076	0.00	6.8E-01	1.6E-02		Š	Š
Bally McCann Hollow			İ			1017	76	075	9	6.8E-01	8.0E-03	8.2E-09	2	S.
South Nest	19717	1.0E-03	1.1E-02	O BE A		970								
Mid Nest	23623	1.0E-03		8 3E.00	-		32	320	90.0	6.8E-01	1.6E-02	,	Š	o N
North Nest	44956	4 0F-04		2 35 00			32	320	0.06	6.8E-01	1.6E-02	1.2E-08	Š	2
Mush Paddle Hollow				3.35-03	7	710	32	320	90.0	6.8E-01	6.4E-03	4.9E-09	_S	2
South Nest	20749	1 0F-03	1 1E-02	A 9E.00										
Mid Nest		2.0E-03		1 AE OB			32	320	90.0	6.8E-01	1.6E-02	1.0E-08	S N	2
North Nest	49712	5.0E-04		3.55.00			32	320	90.0	6.8E-01	3.2E-02	2.0E-08	٩	2
Ballard Hollow			L	20.0	7	017	37	320	90.0	6.8E-01	8.0E-03	5.1E-09	No.	Š
South Nest	17463	2.0E-03	1.1E-02	1.15-08	6	210	ce	000						
Mid Nest	11677	2.0E-03	1.1E-02	1.15-08	-		200	320	000	6.8E-01	3.2E-02		S	2
North Nest	34057	5.0E-04	L	2 RE-09	6		76	320	900	6.8E-01	3.2E-02		S	å
			L		,		32	320	0.06	6.8E-01	8.0E-03	4.1E-09	å	2
*Acute critical effect is slight to moderate skin irritation. Critical Study: Palmer 1990	ght to modera	e skin irritation. C	ritical Study: Pa	Imer 1990					+					
*Chronic critical effects are well defined erythema and edema. Critical Shudy: 1 ewis 1989	are well define	d erythema and ec	dema. Critical St	udv. Lewis 1989										
													-	

Attachment J: Fog Oil - Hatchling Bald Eagles

Cénélo Cmoke											
Oldin Circle			1								Dally Chronic Intake
	Distance (m)	(q/m³)	- Lentration	Ē	ntake Rate (m³/day)		EF (days/yr) ED (yrs)	ED (yrs)	BW (kg)	AT (days)	AT (days) Value (g/kg-day)
				Dally IR	Dally IR Hourly IR	Event IR					
O											
Summer innaration				70.0	0100	0.015	60	0.027	0.5	12775	2.9E-11
South Nest	R7707			7.5					0	36607	
told bild	23638	00000		0.24	0.010	0.015	6.0	0.027	CO	C//71	
Nico Nico				70.0		0 0 0	6	0.027	0.5	12775	
North Nest	42027		,	77.0							
			_								
							_				

Mobile Smoke											
	Distance	Fog Oil Concentration	<u> </u>								of the state of th
	Ê	(g/m³)		Int	Intake Rate (m³/day)	day)	EF (dayslyr)	ED (yrs)	BW (kg)	AT (davs)	Value (ofko-day)
				Dally IR	Hourty IR	Event IR				66	(an Sue)
Summer Inhalation			_								
Musgrave Hollow											
South Nest	25174			0.24	0.010	0.025	16.3	7200	2	47776	07 23 6
Mid Nest	27956	0.0002		0.24	0.010	0.025		0.007	200		3.55-10
North Nest	48211			0.24	0.010	0.005	16.3	0.007	200		3.00-10
Baily McCann Hollow			-					0.021	0.0		1./570
South Nest	19717	0.0002		0.24	0.010	0.025	17.3	7200	40	42775	45 10 0
Mid Nest	23623	0.0002		0.24	0100	0.005		0.027	200		2.05-10
North Nest	44956	0.0001		0.24	0.010	9000		2000	2 0		7.0E-10
Mush Paddle Hollow			-		200	0.043		0.027	CO	12/75	1.3E-10
South Nest	20749	0.0002		0.24	0,00	3000	0.07	1000			
Mid Nest	28050			0.24	0100	0.025		0.027	0.0		2.2E-10
North Nest	49712		1	0.24	000	30.0		0.027	0.0		2.2E-10
Ballard Hollow				5	2	0.020		0.027	6.0	12/75	1.1E-10
South Nest	17463	0.0002		0.24	0.010	0.025	0	7000	9.0		
Mid Nest	11677	0.0005	-	0.24	010			7000	200	27.721	1.7E-10
North Nest	34057	0.0001		0.04	0,000			0.027	0.0		4.35-10
			-	5	200		9.7	0.027	0.5	12775	8.6E-11
			1				,				

															-
Static Smoke						A MAKEN	100	Version TBV	ACUTE	1	Chronic Dose	Acute	Chronic	-	
				Only Chronic Intake	*Acute Toxicity	Toxicity Value		Uncertainty	TRV	Chronic	Adjusted TRV	Hazard	Hazard	Acute	Chronic
-	Distance (m)	Dally Acute Intake Value (q/m³) Value (g/kg-day)	Value (g/m³)	Value (g/kg-day)	Value (g/m³)	(g/m³)	Adjustment	Adjustment	(g/m³)	(g/m³) TRV (g/m³)	(g/kg-day)	Quotlent	Quotlent	Effect	Effect
													_		_
Summer Inhalation									1	1,0	1 67 06	275.04	2 OE 07	Ž	Z
				2 9E-11	9	0.1	32	320	.88	3.1E-04	CO-3C./	4. / E-U+	3.35-01	2	2
South Nest			-	7.30			66	330	4 88	3 1E-04	7 5E-05	2.7E-04	3.9E-07	2	ž
Mid Nest	t 23638	3 5.0E-04	7	2.9E-11	2	7	76	020	3	1	1 50 05	7 11	4 55 07	2	Ž
See March	AROK7	2 05-04	P	1.2E-11	9		32	320	1.88	3.15-04	('DE-02	1.104	1.05-07	2	2
NOIL INCOL											_				
-															
"Acute critical effect is oil pneumonia, Critical Study. Shinn et al. 1987	il pneumonia.	Critical Study: Shint	n et al. 1987												
**Chronic critical effects are minor lesions of the heart, liver and lungs. Critical Study: Driver	are minor les	ons of the heart, liver	and lungs. Ci	ritical Study: Driver et :	r et al. 1992					1					
		-						_			-				1
			1												

Mobile Smoke														
	Distance (m)	Daily Acute Intake Value (g/m³)	Dally Chronic Intake *Acute Toxicity Value (ofko-day) Value (ofko-day)	*Acute Toxicity	Toxicity Value	Acute TRV Uncertainty	Chronic TRV Uncertainty	Acute TRV	Chronic	Chronic Dose Adjusted TRV	Acute Hazard	Chronic Hazard	 	Chronic
						manus for	understand.	Т	L III/B) AN	(g/kg-day)	Guotient	Quotient	Effect	Effect
Summer Inhalation												+	1	
Musgrave Hollow													-	
South Nest		2.0E-04	3.5E-10	9	1.0	32	320	1 88	3 45 04	7 50 06	1 15 01	10.10		
Mid Nest		2.0E-04	3.5E-10	9	0.4	32	320	88	2 4 1 04	7 55 05	4 4 1 04	4.01-00	2	2
North Nest	48211	1.0E-04	1.7E-10	09	-	32	200	90	4	1,30,00	1.10-04	00-00-0	0 :	2
Baily McCann Hollow					5		250	00.1	0.10-04	cn-ac.,	3.3E-U3	2.3E-06	2	2
South Nest	19717	2.0E-04	2.6E-10	09	5	33	320	1 00	2 45 04	70 10	10.11		1	
Mid Nest	23623	2.05-04	2 FE-10	29		3 5	350	80.	2010	CD-3C-7	- IE-04	3.55-96	S Z	2
North Nest	L	4 DE-04	1 25 10	8 8	5	25	320	1.88	3.15-04	7.5E-05	1.1E-04	3.5E-06	No.	S
Mush Paddle Hollow	L		1.36-10	20	5	32	320	1.88	3.1E-04	7.5E-05	5.3E-05	1.7E-06	Š	No
South Nest	20749	2 0F-04	2.25.40	9		18		-						
Mid Nest	L	2.05	2.25-10		5 6	35	320	1.88	3 1E-04	7.5E-05	1.1E-04	2.9E-06	ž	Š
tseN dtroM	L	1050	01-27-7		5	35	320	1.88	3.1E-04	7.5E-05	1.1E-04	2.9E-06	Q	S S
Rallard Hollow	l	+0-30:	1.15-10	9	0.1	32	320	1.88	3.1E-04	7.5E-05	5.3E-05	1.4E-06	oN N	S S
Daliala Hollon	1													
South Nest	-	2.0E-04	1.7E-10	8	0.1	32	320	- 88	3 1F-04	7 5E-05	1 15.04	20 35 0	ON.	SIA.
Mid Nest		5.0E-04	4.3E-10	09	0.1	32	320	1 88	3 15 04	7 55 05	20 27 0	2.7.70 B 8 1 00	2 2	2
North Nest	34057	1.0E-04	8.6E-11	09	10	3	320	1 88	2 4	7 50 00	2.7E-04	00-200	ON :	2
							200	9.	5	ייטבייני	0.55.0	00-37-	9	02
*Acute critical effect is oil	I pneumonia.	*Acute critical effect is oil pneumonia. Critical Study: Shinn et al. 1987									1			
"Chronic critical effects	are minor lesio	"Chronic critical effects are minor lesions of the heart, liver and lungs. Critical Study: Driver	Oritical Study: Driver et a	et al 1992									1	
				_					_				.,	_

The State of the Control of the Cont

Attachment J: Fog Oil - Juvenile Bald Eagles

Distance Fig. 10 Distance Concentration Light Concentration Ligh												
Distance Fag Oil Concentration Fag Oil Concentration Fag Oil Concentration Fag Oil Concentration Gign**)												
10000 0.01 0.05		Distance (m)	Fog Oil Cone (g/m³	entration }	in in in in in in in in in in in in in i	ake Rate (m³/c	day)	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Dally Chronic Intake Value (g/kg-day)
131 0.055 0.002 0.01 0.005 0.002 0.09 0.005					Daily IR	Hourty IR	Event IR					
4000 0.01 1.31 0.055 0.082 0.9 2 4.5 12775 9000 0.002 0.003 0.003 0.003 0.003 0.9 2 4.5 12775 24000 0.0005 1.31 0.055 0.0032 0.9 2 4.5 12775 50000 0.0005 1.31 0.055 0.082 0.9 2 4.5 12775 50000 0.0005 1.31 0.055 0.082 0.9 2 4.5 12775 50000 0.0007 1.31 0.055 0.082 0.9 2 4.5 12775 50000 0.0007 1.31 0.055 0.082 0.9 2 4.5 12775 10000 0.001 0.007 0.007 0.007 0.007 0.007 0.007 0.007 0.007 0.007 0.007 0.007 0.007 0.007 0.007 0.007 0.007 0.007 0.007 0.007	Vinter Inhalation											
6000 0.005 131 0.065 0.082 0.9 2 45 12775 9000 0.007 0.002 0.082 0.9 2 45 12775 9000 0.007 0.013 0.055 0.082 0.9 2 45 12775 50000 0.0000 0.0000 1.31 0.055 0.082 0.9 2 45 12775 50000 0.0000 1.000 1.31 0.055 0.082 0.9 2 45 12775 50000 0.0001 0.0001 0.005 0.005 0.002 0.9 2 45 12775 10000 0.0001 0.0001 0.005 0.005 0.002 0.9 2 45 12775 10000 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 0.001 <t< td=""><td></td><td>4000</td><td></td><td></td><td>1.31</td><td>0.055</td><td></td><td></td><td>2</td><td>4.5</td><td></td><td></td></t<>		4000			1.31	0.055			2	4.5		
1300 0.002 1.31 0.055 0.082 0.99 2 4.5 12775 24000 0.0005 1.31 0.055 0.082 0.99 2 4.5 12775 250000 0.0001 0.0001 1.31 0.055 0.082 0.99 2 4.5 12775 250000 0.0001 0.0001 1.31 0.055 0.082 0.99 2 4.5 12775 25000 0.0001 0.00		2000			1.31	0.055			2	4.5		
1-700 0.001 1.31 0.055 0.082 0.9 2 4.5 12775		0006			1.31	0.055			2	4.5		
24000 0.00002 1.31 0.056 0.082 0.9 2 4.5 12775		1,000			1.31	0.055			2	4.5		5.6E-09
50000 0 0002 131 0.065 0.082 0.9 2 4.5 12775 50000+ 0 0001 0 0001 0 0002 0.045 0.065 0.082 0.9 2 4.5 12775 1 0000 0 0001 0		24000		5	1.31	0.055	<u>.</u>		2	4.5		
50000+ 0.0001 1.31 0.065 0.082 0.9 2 4.5 12775		20000		2	1.31	0.055			2	4.5		
Distance P-09 Uni Pirey SA Prey Weight CF (g/g) (g/gday) CF (g/g) (g/gday) CF (g/g) (g/gday) CF (g/g) (g/gday) CF (g/g) (g/gday) CF (g/g) (g/gday) CF (g/g) (g/gday) CF (g/g) (g/gday) CF (g/g) (g/gday) CF (g/g) CF (g/g) (g/gday) CF (g/g) CF (g/		\$0000÷		-	1.31	0.055			2	4.5		2.6E-10
Tog OII Fog												
Colored Colo												
(m) (g/m²) (m²) (gm²) (gl) (gl/day) (gl/day) (gl/days) (Distance	Deposition	Prey SA	Prey Weight		Intake Rate					Dally Chronic Intake
7500 0.01 0.0874 0.815 0.0011 292.5 0.9 2 4.5 12775 12000 0.005 0.0874 0.815 0.0005 293.5 0.9 2 4.5 12775 12000 0.002 0.0874 0.815 0.0002 294.5 0.9 2 4.5 12775 12000 0.001 0.0874 0.815 0.0002 294.5 0.9 2 4.5 12775 12000 0.001 0.0874 0.815 0.0001 296.5 0.9 2 4.5 12775 12000 0.001 0.0874 0.815 0.0001 296.5 0.9 2 4.5 12775 12000 0.001 0.0874 0.815 0.0000 297.5 0.9 2 4.5 12775 12000 0.0002 0.0874 0.815 0.0000 297.5 0.9 2 4.5 12775 12000 0.0002 0.0874 0.815 0.0000 298.5 0.9 2 4.5 12775 12000 0.001 0.001 0.0275 0.0275 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.		Œ	(g/m²)	(m ₂)	(a)	CF (g/g)	(g/day)	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
7500 0.01 0.0874 0.816 0.0011 282.5 0.9 2 4.5 12775 10000 0.005 0.0874 0.815 0.0005 293.5 0.9 2 4.5 12775 30000 0.001 0.0874 0.815 0.0001 294.5 0.9 2 4.5 12775 50000+ 0.001 0.0874 0.815 0.0001 296.5 0.9 2 4.5 12775 50000+ 0.0002 0.0874 0.815 0.0001 296.5 0.9 2 4.5 12775 50000+ 0.0002 0.0874 0.815 0.0000 296.5 0.9 2 4.5 12775 50000+ 0.001 0.0874 0.815 0.0000 298.5 0.9 2 4.5 12775 10000 0.001 0.001 2.0000 2.0000 2.0000 2.0000 2.0000 4.5 12775 10000 0.002 0.001 <	Winter Indestion											
10000 0.005 0.0874 0.816 0.0005 293.5 0.9 2 4.5 12775 18000 0.002 0.0874 0.815 0.0001 296.5 0.9 2 4.5 12775 18000 0.0002 0.0874 0.815 0.0001 296.5 0.9 2 4.5 12775 18000 0.0002 0.0874 0.815 0.0000 298.5 0.9 2 4.5 12775 18000 0.0002 0.0874 0.815 0.0000 298.5 0.9 2 4.5 12775 18000 0.0001 0.0874 0.815 0.0000 298.5 0.9 2 4.5 12775 18000 0.001 0.0874 0.815 0.0000 0.001 0.275 0.9 0.9 0.9 0.9 18000 0.0002 0.0005 0.0275 0.9 0.9 0.9 0.9 0.9 18000 0.0002 0.0005 0.0275 0.9 0.9 0.9 0.9 0.9 18000 0.0002 0.0005 0.0005 0.0005 0.0005 0.0005 0.0005 0.0005 0.0005 0.0005 18000 0.0001 0.0005 0	D.	7500		0.0874	0.815	0.0011		i	2	4.5		
18000 0,002 0,0874 0,815 0,0001 294.5 0,99 2 4.5 12775 30000 0,0001 0,0874 0,815 0,0001 295.5 0,99 2 4.5 12775 50000+ 0,0002 0,0874 0,815 0,0000 297.5 0,99 2 4.5 12775 50000+ 0,0002 0,0874 0,815 0,0000 298.5 0,99 2 4.5 12775 50000+ 0,0007 0,0874 0,815 0,0000 298.5 0,99 2 4.5 12775 50000+ 0,0007 0,0874 0,815 0,0000 0,0007 0,0007 50000+ 0,0002 0,0007 0,0775 0,977 0,99 2 4.5 12775 50000+ 0,0002 0,0007 0,0275 0,99 0,99 2 4.5 12775 50000+ 0,0002 0,0007 0,0275 0,99 0,99 2 4.5 12775 50000+ 0,0002 0,0007		10000		0.0874	0.815	0.0005			2	4.5		
30000 0.001 0.0874 0.815 0.0001 296.5 0.9 2 4.5 12775		18000		0.0874	0.815				2	4.5		
50000 0.0005 0.0874 0.815 0.0001 296.5 0.9 2 4.5 12775 50000+ 0.0002 0.0874 0.815 0.0000 297.5 0.9 2 4.5 12775 50000+ 0.0001 0.0874 0.0815 0.0000 298.5 0.9 2 4.5 12775 Distance Fog Oil Concentration Skin Surface Area (m²) ABS EF (days/yr) ED (yrs) BW (kg) AT (days) T300 0.01 Skin Surface Area (m²) ABS EF (days/yr) ED (yrs) BW (kg) AT (days) 10000 0.001 0.002 0.275 1 0.9 2 4.5 12775 50000 0.001 0.002 0.275 1 0.9 2 4.5 12775 50000+ 0.0002 0.275 1 0.9 2 4.5 12775 50000+ 0.0002 0.275 1 0.9 2 4.5		30000		0.0874	0.815				2	4.5		
50000+ 0.0002 0.0814 0.0816 0.0000 298.5 0.9 2 4.5 12775 50000++ 0.0001 0.0874 0.815 0.0000 298.5 0.9 2 4.5 12775 Distance Fold (m) Fog Oil Concentration Action of the color of the c		20000		0.0874	0.815				2	4.5		
Source 0.0001 0.0874 0.0815 0.0000 298.5 0.9 2 4.5 12775		÷0000\$		0.0874	0.815				2	4.5		
Distance Fog OII Concentration Skin Surface Area (m²) ABS EF (days/yr) ED (yrs) BW (kg) AT (days) Tool		++00009		0.0874	0.815	0.0000			2	4.5		1.0E-07
Distance Fog OII Concentration Skin Surface Area (m²) ABS EF (days/yr) ED (yrs) BW (kg) AT (days)												
Distance Fog OII Concentration Skin Surface Area (m²) ABS EF (days/yr) ED (yrs) BW (kg) AT (days)												
Contentration Skin Surface Area (m²) ABS EF (dayskyr) ED (yrs) BW (kg) AT (days)												
(m) (glm²) Skin Surface Area (m³) ABS EF (days/hy) ED (yrs) BW (kg) AT (days) 7500 0.01 0.275 1 0.9 2 4.5 12775 10000 0.005 0.275 1 0.9 2 4.5 12775 18000 0.001 0.275 1 0.9 2 4.5 12775 50000 0.001 0.275 1 0.9 2 4.5 12775 50000 0.005 0.275 1 0.9 2 4.5 12775 50000+ 0.0005 0.275 1 0.9 2 4.5 12775 50000+ 0.0002 0.275 1 0.9 2 4.5 12775 50000+ 0.0001 0.0075 0.275 1 0.9 2 4.5 12775 500000+ 0.0001 0.0075 0.275 1 0.9 2 4.5 12775 500000+		Distance	Fog Oil Conc	entration								Dermally Absorbed
7500 0.01 0.275 1 0.9 2 4.5 10000 0.005 0.275 1 0.9 2 4.5 18000 0.002 0.275 1 0.9 2 4.5 30000 0.001 0.275 1 0.9 2 4.5 50000+ 0.0002 0.275 1 0.9 2 4.5 50000+ 0.0002 0.275 1 0.9 2 4.5 50000+ 0.0001 0.275 1 0.9 2 4.5 50000+ 0.0001 0.275 1 0.9 2 4.5		Œ	,m/6)		Skin Surfac	e Area (m²)	ABS	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Dose (g/kg-day)
7500 0.01 0.275 1 0.9 2 4.5 10000 0.005 0.275 1 0.9 2 4.5 10000 0.002 0.275 1 0.9 2 4.5 50000 0.001 0.275 1 0.9 2 4.5 50000+ 0.002 0.275 1 0.9 2 4.5 50000+ 0.001 0.275 1 0.9 2 4.5 50000+ 0.001 0.275 1 0.9 2 4.5 50000+ 0.001 0.275 1 0.9 2 4.5	Winter Dermal Absorpt	lo										
0,005 0,275 1 0,9 2 4.5 0,002 0,275 1 0,9 2 4.5 0,001 0,275 1 0,9 2 4.5 0,0005 0,275 1 0,9 2 4.5 0,0002 0,275 1 0,9 2 4.5 0,0001 0,275 1 0,9 2 4.5 0,0001 0,275 1 0,9 2 4.5 0,0001 0,275 1 0,9 2 4.5					0.2	75	-	6.0				
0.002 0.275 1 0.9 2 4.5 0.001 0.275 1 0.9 2 4.5 0.005 0.275 1 0.9 2 4.5 0.0002 0.275 1 0.9 2 4.5 0.0001 0.275 1 0.9 2 4.5 0.0001 0.275 1 0.9 2 4.5		10000		5	0.2	75	_	6.0				
0.001 0.275 1 0.9 2 4.5 0.0005 0.275 1 0.9 2 4.5 0.0002 0.275 1 0.9 2 4.5 0.0001 0.275 1 0.9 2 4.5 0.0001 0.275 1 0.9 2 4.5		18000		2	0.2	75	1	0.0				
0,0005 0,275 1 0,9 2 4,5 0,0002 0,275 1 0,9 2 4,5 0,0001 0,275 1 0,9 2 4,5 1 0,001 2 4,5 4,5		30000		1	0.2	75	•	0.9				
0,0002 0,275 1 0,9 2 4,5 0,001 0,275 1 0,9 2 4,5		20000		5	0.2	75	-	6.0			ĺ	
0,0001 0,275 1 0,9 2 4,5		£0000÷		21	0.2	75		0.0				
		++00005		1	0.2	75	+	6.0				8,8E-10

(m) Fog Oil Cone (m) (glm) Winter Inhalation 3000 0.00 4000 7000 0.00 7000 0.00 0.00 16000 0.00 0.00 30000 0.00 0.00 50000 0.000 0.00 10000 0.000 0.001 10000 0.001 0.001 10000 0.0001 0.0001 50000 0.0001 0.0001 50000+ 0.0001 0.0001 50000+ 0.0001 0.0001	Golf Concentration Golf	Prey Weight (9)	Heurity IR 0.055 0	Event IR 0.136 0.136 0.136 0.136	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Dally Chronic Intake Value (g/kg-day)
3000 4000 4000 10000 10000 50000 50000 18000 18000 18000 18000 50000 600000 60000 60000 60000 60000 60000 60000 60000 60000 6000	1000 0000 0000 0000 0000 0000 0000 000	Intak Dally IR 1.31 1.31 1.31 1.31 1.31 1.31 1.31 (g)	Hourly IR (m³/d; Hourly IR (m³/d; Hourly IR (m²/d; Hourly	Event	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
3000 4000 10000 16000 30000 50000 50000 (m) (g/m² 7500 18000 18000 50000 60000+ 0	001 002 0005 0001 0001 0001 0001	╼┽┼╧┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼┼	Heurly IR 0.055 0.055 0.055 0.055 0.055 0.055 0.055	0.136 0.136 0.136 0.136					
3000 4000 10000 16000 30000 50000 50000 10000 1800	001 002 003 000 001 100 001 001	1.31 1.31 1.31 1.31 1.31 1.31 1.31 (g)	0.055 0.055 0.055 0.055 0.055 0.055 0.055	0.136 0.136 0.136 0.136					
3000 7000 10000 16000 30000 50000 50000 180000 18000 18000 18000 18000 18000 18000 18000 18000 180	001 002 000 001 001 001 001	131 131 131 131 131 131 131 (9)	0.055 0.055 0.055 0.055 0.055 0.055 0.055	0.136 0.136 0.136 0.136					
1000 10000 10000 50000 50000 50000 10000 18000 1	005 001 005 007 001 11	1.31 1.31 1.31 1.31 1.31 1.31 (9)	0.055 0.055 0.055 0.055 0.055 0.055 0.055	0.136 0.136		2	4.5	12775	7.8E-07
7000 16000 16000 50000 50000 16000 18000	005 005 0002 001 001	131 1.31 1.31 1.31 1.31 1.31 (g)	0.055 0.055 0.055 0.055 0.055 0.055 0.055	0.136	16.3	2	4.5	12775	3.9E-07
10000 30000 50000 50000 100000 100000 100000 100000 10000 10000 10000 10000 10000	900 900 900 100 100 100 100 100 100 100	1.31 1.31 1.31 1.31 (9)	0.055 0.055 0.055 0.055 0.055	0.136	16.3	2	4.5	12775	1.6E-07
16000 30000 50000 50000 Distance Deposit (m) (g/m² (g/m	900 900 100 Pr	1.31 1.31 1.31 (9) (9)	0.055 0.055 0.055 0.055		16.3	2	4.5	12775	7.8E-08
30000 50000 10000 18000 18000 18000 18000 18000 18000 18000 18000 18000 18000 18000 18000 18000 18000 18000 18000 18000	000 N	1.31 1.31 Prey Weight (9)	0.055 0.055 0.055 CF (9/9)	0.136	16.3	2	4.5	12775	3.9E-08
50000 Distance Deposit (m) (g/m² 7500 10000 18000 50000 60000+ 0 50000+ 0	P P P	Prey Weight (g)	0.055 CF (9/9)	0.136		2	4.5		1.6E-08
Distance Depos (m) (g/m) 7500 10000 18000 30000 50000+ 50000+	<u> </u>	Prey Weight (9)	CF (9/9)	0.136		2	4.5		7.8F-09
Pog Distance Depos (m) (g/n 7500 10000 18000	F	Prey Weight (g)	CF (9/9)						
Distance Depos (m) (g/n)	g	Prey Weight (g)	CF (9/9)						
(m) (g/m) (g	10.0	(9)	CF (9/9)	Intake Rate					Daily Chronic Intake
7500 10000 18000 30000 50000 50000+		0.815	1500	(g/day)	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
7500 10000 18000 30000 50000 50000+		0.815	1000	Dally IR					
		0.815						-	
			0.001	292.5		2	4.5		1.8E-04
		0.815	0.0005	293.5		2	4.5		8.9E-05
		0.815	0.0002	294.5		2	4.5	12775	3.6E-05
	1	0.815	0.0001	295.5		2	4.5	5 12775	1.8E-05
		0.815	0.0001	296.5		2	4.5	5 12775	90-30.6
		0.815	0.000	297.5		2	4.5	5 12775	3.6E-06
	0.0874	0.815	0.0000	298.5	16.3	2	4.5	5 12775	1.8E-06
-									
(m)	(g/m²)	Skin Surface Area (m²)	Area (m²)	ABS	EF (days/yr)	ED (yrs)	BW (kg)	AT (days)	Dermally Absorbed Dose (g/kg-day)
Winter Dermal Absorption									
7500	0.01	0.275		1	16.3	2	4.5	5 12775	1.6E-06
	0.005	0.275		1	16.3	2	4.5		7.8E-07
	0.002	0.275		1	16.3	2	4.5		3.1E-07
	0.001	0.275		1	16.3	2	4.5		1.6E-07
	0.0005	0.275		1	16.3	2	4.5	5 12775	7.8E-08
	0.0002	0.275		1	16.3	2	4.5		3.1E-08
20000++ 000	0.0001	0.275		1	16.3	2	4.5	5 12775	1.6E-08
			+						
			1						

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The control of the		Dally Chronic Intake (2,6E-08) (1,3E-09) (1,3E-09) (1,3E-09) (1,3E-09) (1,3E-09) (1,3E-09) (1,3E-09) (1,3E-09) (1,0E-05) (1,0	e (g/m³) 60 60 60 60 60 60 60 60 60	"Chronic oxicity Value (g/m³)	Acute TRV Uncertainty Adjustment	Chronic TRV Uncertainty Adjustment		Chronic	Chronic Dose Adjusted TRV	Acute Hazard	Chronic	Action	
		7) Value (g/kg-day) 1.3E-08 1.3E-08 1.3E-09 1.	09 09 09 09 09	(g/m³)	Adjustment	Adjustment				-		-	Chronic
1.5E color 60		2.6E 1.3E 5.2E 2.6E 5.2E 5.2E 5.2E 2.6E Dally Chronic Int Dally Chronic Int Dally Chronic Int Dally Chronic Int 1.0E 5.0E		0.1			1	rRV (g/m³)	(g/kg-day)	Quotlent	Quotient	Effect	Effect
1,150,-06 1,15		2.6E 1.3E 5.2E 1.3E 1.3E 1.3E 5.2E 5.2E 5.2E Dally Chronle Int Dally Chronle Int Dally Chronle Int Dally Chronle Int 1.0E 2.0E		0.1									
186-08 100 10 10 10 10 10 10		2.6E 5.7E 5.7E 5.2E 5.2E 5.2E 5.2E Dally Chronic Inti (g/kg-day) Value (g/kg-day) 1.0E 5.0E		0.1								;	
13E-56 50 0 0 1 32 320 158 31E-54 4 1504 32E-50 No 1 1 1 1 1 1 1 1 1		1.3E 2.6E 2.6E 2.6E 2.6E 2.6E 2.6E 2.6E 2.6			32	320	1.88	3.1E-04	4.1E-04	1	6.4E-05	2	일:
Size Size		5.26 1.36 5.26 2.66 2.66 2.66 Dally Chronic Int Dally Chronic Int Dally Chronic Int (1.06 5.06 5.06 2.00		0.1	32	320	1.88	3.1E-04	4.1E-04		3.2E-05	2	2
Siego Go Go Go Go Go Go Go	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	2 6E 5 1.3E 5 1.3E 5 1.3E Critical Study. Driver Dally Chronic Int Dally Chronic Int Dally Chronic Int 1.0E 5 0E 2 0E		0.1	32	320	1.88	3.1E-04	4.16-04	-	1.3E-05	2	2
Siego Sieg		1.0E Critical Study: Driver Critical Study: Driver Dally Chronic Inti 1.0E 1.0E 2.0E		0.1	32	320	1.88	3.1E-04	4.1E-04	_	6.4E-06	2	2
Chical Study: Diner et al. 1992 Chic	5 6 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Critical Study. Driver Daily Chronic Int Daily Chronic Int Daily Chronic Int (9) Value (g/kg-day		0.1	32	320	1.88	3.1E-04	4.1E-04		3.2E-06	S	2
Curical Study: Divice et al. 1932 Curical Study: Divice et al. 1932 Curical Study: Divice et al. 1932 Curical Study: Divice et al. 1932 Curical Study: Divice et al. 1932 Curical Study: Divice et al. 1932 Curical Study: Divice et al. 1932 Curical Study: Divice et al. 1932 Curical Study: Divice et al. 1932 Curical Study: Divice et al. 1932 Curical Study: Divice et al. 1932 Curical Study: Divice et al. 1932 Curical Study: Divice et al. 1932 Curical Study: Divice et al. 1932 Curical Study: Divice et al. 1933 Curical Study: Divice et al.	2 2 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Critical Study. Driver Dally Chronic Int Dally Chronic Int (1.0E		0.1	32	320	1.88	3.1E-04	4.1E-04		1.3E-06	S	2
Daily Chronic intake Acute Toxicity Toxicity Value Ghronic TRV Try	2 2 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Critical Study: Driver Dally Chronic Int. Dally Chronic Int. 1.0E 5.0E	. 1992	0.1	32	320	1.88	3.1E-04	4.1E-04		6.4E-07	운	S
Circle Study, Diner et al. 1582 Circle Study, Diner et al. 1582 Circle Study, Diner et al. 1582 Circle Study, Diner et al. 1582 Circle Study, Diner et al. 1582 Circle Study, Diner et al. 1582 Circle Study, Diner et al. 1582 Circle Study, Diner et al. 1582 Circle Study, Diner et al. 1582 Circle Study, Barinechiat 1898 Circle Study, Barinechiat 1898 Circle Study, Barinechiat 1898 Circle Study, Barinechiat 1898 Circle Study, Barinechiat 1899 Circle Study, Barinechiat 1899 Circle Study, Barinechiat 1899 Circle Study, Barinechiat 1899 Circle Study, Barinechiat 1899 Circle Study, Barinechiat 1899 Circle Study, Barinechiat 1899 Circle Study, Barinechiat 1899 Circle Study, Barinechiat 1899 Circle Study, Barinechiat 1899 Circle Study, Barinechiat 1890 Circle Study, Barinechiat 1899 Circle Study, Barinechiat 1890 Circle Study, Barinech	2 2 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Critical Study. Driver Dally Chronic Int g) Value (g/kg-day	1. 1992										
Catholic Study Divine et al. 1992 Acute Chronic TRY Acute Acute Chronic TRY Acute Chronic TRY Acute Chronic TRY Acute Chronic TRY	2 2 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Dally Chronic Integration (g/kg-day) Value (g/kg-day) 1.0E 5.0E	1992										
Distance Distance	Distance miss Daily Acute Intake Value (g/kg) 1.1E-03 1.0000 1.1E-04 1.0000 1.1E-04 1.0000 1.1E-04 1.0000 1.1E-04 1.0000 1.1E-05 1.0000 1.1E-05 1.0000 1.1E-05 1.0000 1.1E-05 1.0000 1.1E-05 1.00000 1.0000 1.00000 1.00000 1.00000 1.00000 1.00000 1.000	Dally Chronic Int Value (g/kg-đa) 1.0E 5.0E											
Distance Chical Chi	(m) Dally Acute Intake Value (g/kg) 7500 1.1E-03 1.0000 5.4E-04 1.0000 5.4E-04 5.0000 5.4E-04 5.0000 5.4E-05 5.0000 5.4E-05 5.0000 5.4E-05 5.0000 5.4E-05 5.0000 5.4E-05 5.0000 5.4E-05 5.0000 5.4E-05 5.0000 5.4E-05 5.0000 5.4E-05 5.0000 5.4E-05 5.0000 5.4E-05 5.0000 5.4E-05 5.0000 5.4E-01 5.0000 5.4E-01 5.4E-01 5.0000 5.4E-01 5.4E-	Dally Chron Value (g/k											
Thirty Daily Acute Intake Value (gilg) Avaine (gilg) A	TS00	Value (g/k	—	**Chronic	Acute TRV	Chronic TRV	Acute			Acute	Chronic	Acute	Chronic
Total Tota	7500 1.1E-03 10000 5.4E-04 18000 2.1E-04 30000 1.1E-04 50000+ 1.1E-05 50000+ 2.1E-05 50000+ 2.1E-05 50000+ 1.1E-05 50000+ 1.1E-05 50000+ 1.1E-05 50000+ 1.1E-05 50000+ 1.1E-05 50000+ 1.1E-05 50000+ 1.1E-05 50000 1.0E-02 50E-01 10000 5.0E-03 5.0E-01 5.0E-01 5.0E-03 5.0E-03 5.0E-0			(g/kg)	Adjustment	Adjustment	(g/kg)	Chron	c TRV (g/kg)	Quotient	Quotlent	Effect	Effect
1500 116.03 106.05 176 176 122 22 22 22 22 22 22	7500 1.1E.03 1.0000 5.4E.04 1.0000 5.4E.04 1.0000 5.4E.04 1.0000 1.1E.04 1.0000 1.1E.04 1.0000 1.1E.05 1.0000+ 1.1E.05 1.0000+ 1.1E.05 1.0000+ 1.1E.05 1.0000 1.0E.05 1.0E.05 1.0E.05 1.0E.05 1.0E.05 1.0E.01 1.0E	1.0E-05 5.0E-06 2.0E-06		·									
176 22 32 3200 6500 69E-03 9.7E-04 No 1.9E-04	7500 1.1E-03 1.1E-03 1.1E-03 1.1E-03 1.1E-04 1.1E-04 1.1E-04 1.1E-04 1.1E-04 1.1E-04 1.1E-04 1.1E-04 1.1E-04 1.1E-05	1.0E-05 5.0E-06 2.0E-06							20	00.10	4 67 03	4	2
Secondary Colored Co	10000 5.4E-04 18000 1.1E-04 18000 1.1E-04 18000 1.1E-05 50000	5.0E-06		22	32	3200	0.5500		9E-03	20-12	50-20-	2	2
Fig. 22 320 0.5500 6.9E-03 1.9E-04 No No No No No No No N	1800 2.1E-04 3000 1.1E-04 3000 5.0E-05 50000 5.0E-05 50000 5.0E-05 50000 5.0E-05 50000 5.0E-05 50000 5.0E-05 50000 5.0E-05 50000 5.0E-05 50000 5.0E-05 50000 5.0E-05 50000 5.0E-05 5.	2.05-06		22	32	3200	0.5500	٩	.9E-03	9.7E-04	7.3E-04	2	2
Fig. 22 32 3200 0.5500 6.9E-03 1.9E-04 1.5E-04 No	30000 11E-04			22	32	3200	0.5500		.9E-03	3.9E-04	2.9E-04	2	2
Fig. 22 320 0.5500 6.9E-03 3.7E-05 7.4E-05 No No No No No No No N	50000+ 5.4E-05	1.0E-06		22	32	3200	0.5500		:9E-03	1.9E-04	1.5E-04	2	2
11.6 22 32E -05 No 1.5E -05 1.5E -05 No 1.5E -	Chronic critical effects are weight loss and lesions of theirier, splen, and kidne	5.1E-07		22	32	3200	0.5500		.9E-03	9.7E-05	7.4E-05		2
11.6 12.6 15.6	**Cute critical effects are weight loss and lesbons of theirber, splen, and kidne ***Chronic critical effects are weight loss and lesbons of theirber, splen, and kidne ***Chronic critical effects are weight loss and lesbons of theirber, splen, and kidne ***Chronic critical effects are weight loss and lesbons of theirber, splen, and kidne ***Distance Intake Value Skin Surface D (m) (g/m²) Area (m²) ***Minter Dermal Absorption 7500 1.0E-03 2.8E-01 18000 2.0E-03 2.8E-01 ***Second Processing Street Control Co	2.0E-07		22	32	3200	0.5500		.9E-03	3.9E-05	3.0E-05		운 : /
Second 1958 Second 1958 Second 1958 Second 1958 Second 1958 Second 1958 Second 1959 Second 195	"Acute critical effects are weight loss and lesions of theliver, splen, and kidne". Chronic critical effect is gastrointestinal irration. Critical Study. Lewis 198 (Chronic critical effect is gastrointestinal irration. Critical Study. Lewis 198 (Chronic critical effect is gastrointestinal interpretation of the color of	1.0E-07		22	32	3200	0.5500		.9E-03	1.9E-05	1.5E-05	1	
bpd **Chronic Acute TRV Chronic TRV Acute Acute Chronic TRV Acute Chronic TRV Acute Chronic TRV Acute Chronic TRV Chronic TRV Chronic TRV Chronic TRV Acute Chronic TRV<	**Acute critical effects are weight loss and lesions of theliver, splen, and kidne ***Chronic critical effect is gastrointestinal inflation. Critical Study. Lewis 198 Dally Actife Distance Intake Value Skin Surface Distance Intake Value Skin Surface Distance Intake Value Skin Surface Distance (m) **Total Sudy. Lewis 198 198 198 Nin Surface Distance Intake Value Skin Surface Distance (m) **Total Sudy. Lewis 198 198 198 Nin Surface Distance Dist												
Chronic Chronic Chronic TRV Chronic		Critical Stu	ramachari 1958										
bed Acute Toxicity Toxicity Value Uncertainty Acute Toxicity Toxicity Value Uncertainty Chronic TRV (g/kg) Chronic TRV (g/kg) Acute Chronic TRV (g/kg) Chronic TRV (g/kg)	Distance intake Value Skin Surface (m) (glm²) Area (m²) 7500 1.0E-02 2.8E-01 18000 2.0E-03 2.8E-01 30000 1.0E-03 2.8E-01 5.0000 2.0E-03 2.8E-01 5.0000 2.0E-03 2.8E-01	Lewis 1989											
bed Acute Toxicity Toxicity Value Cunding Acute Toxicity Toxicity Value Cunding Acute Toxicity	Distance Intake Value Skin Surface Intake Value Skin Surface Intake Value Area (m²)			A 1000 1000	THE PERIOD	View Park	Active			Actife	Chronic		
Value g/kg) Gykg) Adjustment Adjustment Gykg) Chronic TRV (g/kg) Quotient Effect Effect Effect Chronic TRV (g/kg) Quotient Chronic TRV (g/kg) Quotient Chronic TRV (g/kg)	(m) (g/m²) Area (m²) (m²) (g/m²) (m²) (g/m²) (m²) (m²) (m²) (m²) (m²) (m²) (m²) (Desmolby obcor		Confeth Value	Incadalativ	Hacertainty	20.2			Hazard	Hazard	Acute	Chronic
E-08 2 216 32 320 0.0625 6.8E-01 1.6E-01 1.3E-07 No E-08 2 216 32 320 0.0625 6.8E-01 3.2E-02 6.6E-08 No E-08 2 216 32 320 0.0625 6.8E-01 3.2E-02 2.6E-08 No E-09 2 216 32 320 0.0625 6.8E-01 3.2E-02 2.6E-08 No E-09 2 216 32 320 0.0625 6.8E-01 1.6E-02 1.3E-09 No E-09 2 216 32 320 0.0625 6.8E-01 1.6E-02 1.3E-09 No E-09 2 216 32 320 0.0625 6.8E-01 3.2E-03 No E-09 2 216 32 320 0.0625 6.8E-01 3.2E-03 No E-09 2 216 32 320 0.0625 6.8E-01	7500 1.0E-02 10000 5.0E-03 18000 2.0E-03 30000 6.0E-03	dose (a/ka-da		(afka)	Adlustment	Adlustment	(a/ka)	Chron	ic TRV (g/kg)	Quotient	Quotlent	Effect	Effect
E.08 2 216 32 320 0.0625 6.8E-01 1.6E-01 1.3E-07 No E.08 2 216 32 320 0.0625 6.8E-01 8.0E-02 6.5E-08 No E.08 2 216 32 320 0.0625 6.8E-01 3.2E-02 2.6E-08 No E.09 2 216 32 320 0.0625 6.8E-01 1.6E-02 1.3E-08 No E.09 2 216 32 320 0.0625 6.8E-01 1.6E-02 1.3E-08 No E.09 2 216 32 320 0.0625 6.8E-01 3.2E-02 2.6E-08 No E.09 2 216 32 320 0.0625 6.8E-01 3.2E-03 1.0E-03 No E.09 3 32 320 0.0625 6.8E-01 1.6E-03 1.3E-09 No E.00 2 216 32 320 0.0625	7500 1.0E-02 10000 5.0E-03 18000 2.0E-03 30000 1.0E-03	╀	6	(5)									
E.08 2 216 32 320 0.0625 6.8E-01 1.6E-01 1.3E-07 No E.08 2 216 32 320 0.0625 6.8E-01 3.0E-02 2.6E-08 No E.08 2 216 32 320 0.0625 6.8E-01 3.2E-02 2.6E-08 No E.09 2 216 32 320 0.0625 6.8E-01 1.6E-02 1.3E-08 No E.09 2 216 32 320 0.0625 6.8E-01 1.6E-02 1.3E-08 No E.09 2 216 32 320 0.0625 6.8E-01 8.0E-02 6.5E-09 No E.09 2 216 32 320 0.0625 6.8E-01 3.2E-03 2.6E-09 No E.09 2 216 32 320 0.0625 6.8E-01 1.6E-02 1.3E-09 No E.09 2 216 32 320	7500 1.0E-02 10000 5.0E-03 18000 2.0E-03 30000 1.0E-03		-	-									
E-08 2 216 32 320 0.0625 6.8E-01 8.0E-02 6.5E-08 No E-08 2 216 32 320 0.0625 6.8E-01 3.2E-02 2.6E-08 No E-09 2 216 32 320 0.0625 6.8E-01 3.2E-02 1.3E-08 No E-09 2 216 32 320 0.0625 6.8E-01 8.0E-03 6.5E-09 No E-09 2 216 32 320 0.0625 6.8E-01 3.2E-03 2.6E-09 No E-10 2 216 32 320 0.0625 6.8E-01 1.6E-03 1.3E-09 No E-10 2 216 32 320 0.0625 6.8E-01 1.6E-03 1.3E-09 No E-10 2 216 32 320 0.0625 6.8E-01 1.6E-03 1.3E-09 No	5.0E-03 2.0E-03 1.0E-03		2	216	32	320	0.0625		3.8E-01	1.6E-01		İ	2
E.08 2 216 32 320 0.0625 6.8E-01 3.2E-02 2.6E-08 No E.09 2 216 32 320 0.0625 6.8E-01 1.6E-02 1.3E-08 No E.09 2 216 32 320 0.0625 6.8E-01 8.0E-03 6.5E-09 No E-10 2 216 32 320 0.0625 6.8E-01 3.2E-03 2.6E-09 No E-10 2 216 32 320 0.0625 6.8E-01 1.6E-03 1.3E-09 No E-10 2 216 32 320 0.0625 6.8E-01 1.6E-03 1.3E-09 No	2.0E-03 1.0E-03			216	32	320	0.0625		3.8E-01	8.0E-02			2
E.09 2 216 32 320 0.0625 6.8E-01 1.6E-02 1.3E-03 No E.09 2 216 32 320 0.0625 6.8E-01 3.0E-03 6.5E-09 No E.10 2 216 32 320 0.0625 6.8E-01 3.2E-03 2.6E-09 No E.10 2 216 32 320 0.0625 6.8E-01 1.6E-03 1.3E-09 No	1.0E-03			216	32	320	0.0625	_	3.8E-01	3.2E-02			2
E-09 2 216 32 320 0.0625 6.8E-01 8.0E-03 6.5E-09 No E-09 2 216 32 320 0.0625 6.8E-01 3.2E-03 2.6E-09 No E-10 2 216 32 320 0.0625 6.8E-01 1.6E-03 1.3E-09 No	FO 20 9			216	32	320	0.0625		3.8E-01	1.6E-02			2
E-09 2 216 32 320 0.0625 6.8E-01 3.2E-03 2.6E-09 No E-10 2 2.16 32 320 0.0625 6.8E-01 1.6E-03 1.3E-09 No	\$0-U0.0			216	32	320	0.0625		5.8E-01	8.0E-03			2
E-10 2 216 32 320 0.0625 6.8E-01 1.6E-03 1.3E-09 No	2.0E-04			216	32	320	0.0625		3.8E-01	3.2E-03			2
*Acute critical effect is slight to moderate skin irritation. Critical Study: Palmer 1990	1.0E-04			216	32	320	0.0625		5.8E-01	1.6E-03			2
*Acute critical effect is slight to moderate skin irritation. Critical Study: Palmer 1990													
	*Acute critical effect is slight to moderate skin irritation. Critical Study. Palm	tudy: Palmer 1990											

A Magneting of the Control of the Co

Mobile Smoke															
						Chronic	Acute TRV	Chronic TRV	Acure		Chronic Dose	20.00	910019	1	
	Distance				•	Toxicity Value	Uncertainty	Uncertainty	TRV	Chronic	Adjusted TRV	Hazard	Hazard	Acute	Chronic
	Œ)	Dally Acute Intake Value (g/m²)	ike Value (g/m²)	Value (g/kg-day)	Value (g/m²)	(g/m²)	Adjustment	Adjustment	(g/m³)	TRV (g/m³)	(g/kg-day)	Quotient	Quotient	Effect	Effect
Winter Inhalation															
	3000	1.0E-02	-02	7.8E-07		0.1	32	320	1 88	3.1E.04	A 15.04		1 00 03	1	1
	4000		-03	3.9E-07	8	0.1	32	320	1,88	3.1E-04	4 1E-04	2.3E-03		2 2	2 2
	7000		-03	1.6E-07		0.1	32	320	1.88	3.1E-04	4 1E-04			2 2	2 2
	10000		-03	7.8E-08		0.1	32	320	1.88	3.1E-04	4.1E-04		1 9F-04	2	2 2
	16000		9	3.9E-08	09	0.1	32	320	1.88	3.1E-04	4 1E-04		9 55-05	2	2
	30000		704	1.6E-08	09	0.1	32	320	1.88	3.1E-04	4 1F-04			2 2	2 2
	20000	1.0E-04	-04	7.8E-09		0.1	32	320	188	3.15.04	4 1E-04			2 2	2 2
									8	10.31	10-11		20-36-7	2	202
*Acute critical effect is oil pneumonia. Critical Study: Shinn et al. 1987	il pneumonia.	Critical Study: Sh	inn et al. 1987											+	
"Chronic critical effects are minor lesions of the heart, liver and lungs. Critical Study: Driver	are minor lesion	ons of the heart, liv	er and lungs. Ci	ē	al. 1992									1	
				1											
						**Chronic	Acute TRV	Chronic TRV	Acute			Acute	Chronic	l	
	Distance			Dally Chrontc Intake	*Acute Toxicity	Toxicity Value	Uncertainty	Uncertainty	TRV			Laterd	Lateral	4	-1
	Œ	Daily Acute Intake Value (g/kg)	ke Value (g/kg)	Value (g/kg-day)	Value (g/kg)	(g/kg)	Adjustment	Adjustment	(g/kg)	Chron	Chronic TRV (g/kg)	Quotlent	Quotient	Effect	Effect
vvinter ingestion	2005														
	one,		-03	1.8E-04			32		0.55	9	9E-03	1.9E-03	2.6E-02	2	2
	10000		8	8.9E-05			32	3200	0.55	9	6.9E-03	9.7E-04	1.3E-02	2	2
	18000		90	3.6E-05			32		0.55	9	6.9E-03	3.9E-04	5.2E-03	2	2
	30000		-04	1.8E-05			32		0.55	9	6.9E-03	1 9F-04		Z	2
	20000		-05	9.0E-06			32		0.55	9	6.9E-03	9 7F-05		2	2
	\$0000÷	2.1E-05	-02	3.6E-06	17.6		32		0.55	9	6.9E-03	3 9F-05		2	212
	20000++	1.1E-05	-02	1.8E-06		22	32	3200	0.55	9	6 9F-03	1 9 - 15	2 6E-04	2 2	2 2
											00 70	20.1		2	2
*Acute critical effects are weight loss and lesions of theliver, splen, and kidney.	e weight loss a	nd lesions of thelic	rer, splen, and kit	. Critical Study:	Bramachari 1958										
**Chronic critical effect is gastrointestinal irritation. Critical Study: Lewis 1989	s gastrointestin	al Initation Critica	al Study: Lewis 1											+	
		Daily Acute				Chronic	Acute TRV	Chronic TRV	Activa			1			
	Distance	Intake Value	Skin Surface	Dermally absorbed	*Acute Toxicity	Toxicity Value	Uncertainty	Incertainty	2			Danie C	CHIONIC	-	
	Ê	(g/m²)	Area (m²)	dose (q/kg-dav)	Value (a/ka)	(a/ka)	Adiustment	Adlustment	10/60	1	Chamba TDV (after)	nazard	Hazard	Acute	on in
					100	16.61		Walliam Co.	(guille)		C LAV (g/Ag)	Guorient	Cuotient	Eneg	EHECK
Winter Dermal Absorption														+	
	7500		2.8E-01	1.6E-06	2		32	320	90.0		6.8F-01	1 GE-01	2 3E OB	2	2
	10000		2.8E-01			216	32	320	0 06		6.8E-01	R OF 02		2 2	2 2
	18000		2.8E-01		2		32	320	0 0		6.8E-01	3.2E-02		2 2	2 2
	30000		2.8E-01				32	320	90 0		6 BE-04	4 65 00		2 2	2
	20000		2.8E-01				32	320	0 0		6 AE-01	10 HO 8		2 2	2 2
	\$0000÷		2.8E-01				32	320	0.06		6.8F-01	3.2F_03		2 2	2 5
	\$0000 ++	1.0E-04	2.8E-01			216	32	320	0.06		6.8E-01	1 6F-03	2 3E-08	2 2	2 2
															2
"Acute critical effect is slight to moderate skin irritation. Critical Study: Palmer 1990	light to modera	te skin irritation. (Oritical Study: Pa	almer 1990											
**Chronic critical effects are well defined erythema and edema. Critical Study: Lewis 1989	are well define	enythema and e	dema. Critical St	tudy: Lewis 1989										1	

Attachment J: Terephthalic Acid (TPA) Grenades and Smoke Pots - Nursing Indiana Bats

Indiana bat nursing pup risk characterization for TPA exposure under Pasquill Category B.

TPA Smoke Grenades														
	Distance (m)	Daily Acute Intake Value (q/m³)	Daily Chronic Intake *Acute Value (g/kg-day)	*Acute Toxicity Value (g/m³)	Toxicity Value	Acute TRV Uncertainty Adjustment	Chronic TRV Uncertainty Adjustment	Acute TRV (g/m³)	Chronic TRV (g/m³)	Chronic Dose Adjusted TRV (g/kg-day)	Acute Hazard Quotient	Chronic Hazard Quotient	Acute Effect	Chronic Effect
Summer Foraging/Roosting Inhalation	ing Inhalation													
	3000	9.0E+00	5.3E-05	8.6	9.6	1	30	8.6E+00	2.9E-01	9.7E-05	1.0E+00	5.5E-01	Yes	ž
	4000	5.0E-03	3.0E-08	8.6	8.6	1	30	8.6E+00	2.9E-01	9.7E-05	1	3.1E-04	2	Ž
	4000	2.0E-03	1.2E-08	8.6	8.6	-	30	8.6E+00	2.9E-01	9.7E-05	2.3E-04	1.2E-04	운	2
	4000	1.0E-03	5.9E-09	8.6	8.6	-	30	8.6E+00	2.9E-01	9.7E-05	1.2E-04	6.1E-05	2	ž
	2000	5.0E-04	3.0E-09	8.6	8.6	-	30	8.6E+00	2.9E-01	9.7E-05	5.8E-05	3.1E-05	2	2
	2000	2.0E-04	1.2E-09	8.6	8.6	-	30	8.6E+00	2.9E-01	9.7E-05	2.3E-05	1.2E-05	2	2
	0009	1.0E-04	5.9E-10	8.6	8.6	1	30	8.6E+00	2.9E-01	9.7E-05	1.2E-05	6.1E-06	2	S
*Acute critical effects are	necrosis and i	Acute critical effects are necrosis and inflamation of the nasal cavity. Critical Study. Muse et al. 1995	al Study. Muse et al. 19	95										
**Chronic critical effects	are edema of lu	**Chronic critical effects are edema of lungs and emphysema. Critical Study. Muse et al. 1995	y. Muse et al. 1995											
TPA Smoke Pots														
					**Chronic	Acide TRV	Chronic TRV	Acute		Chronic Dose	Acute	Chronic	-	
	Distance	Daily Acute Intake Value (n/m³)	Daily Chronic Intake *Acute	*Acute Toxicity	Toxicity Value	Uncertainty	Uncertainty	TRV (a/m³)	Chronic TRV (a/m³)	Adjusted TRV (q/kq-day)	Hazard	Hazard Quotient	Acute	Chronic Effect
			(f = g = g)		2									
Summer Foraging/Roosting Inhalation	ing Inhalation										1		1	
	3000	9.0E+00	1.6E-05	8.6	8.6	-	30		2.9E-01	9.7E-05		1.7E-01	Kes	Š
	4000	5.0E-03	60-30'6	8.6	8.6	-	30	8.6E+00	2.9E-01	9.7E-05		9.3E-05	2	Š
	2000	2.0E-03	3.6E-09	8.6	8.6	-	30		2.9E-01	9.7E-05	2.3E-04	3.7E-05	2	ž
	2000	1.0E-03	1.8E-09	8.6	8.6	-	90	8.6E+00	2.9E-01		1.2E-04	1.9E-05	운	2
	5000		9.0E-10	8.6	8.6	1	30	8.6E+00	2.9E-01				운	Š
	0009		3.6E-10	8.6	8.6	-	30	8.6E+00	2.9E-01				2	ž
	7000		1.8E-10	8.6	8.6	1	93	8.6E+00	2.9E-01	9.7E-05	1.2E-05	1.9E-06	2	2
*Acute critical effects are	necrosis and	Acute critical effects are necrosis and inflamation of the nasal cavity. Critical Study. Muse et al. 1995	al Study. Muse et al. 19	95										
**Chronic critical effects	are edema of I	**Chronic critical effects are edema of lungs and emphysema. Critical Study. Muse et al. 1995	ly: Muse et al. 1995											

Indiana bat nursing pup intake for TPA under Pasquill Category B.

				_			nursing pups			
	Distance					ü				cylinder of court of cylinder
	Œ	TPA Concentration (g/m3)		Intake Rate (m³/day)	day)	(event/yr)	ED (yrs)	BW (kg)	AT (days)	Value (a/kg-day)
			Daily IR	Hourly IR	Event IR					
Summer Foraging/Roosting Inhalation	ting Inhalation									
	3000	5	3.4E-04	1.4E-05	5.9E-07	3136	0.049	9000	2555	A 3E.05
	4000	0.005	3.4E-04			3136	0.049	0000		
	4000	0.002	3.4E-04	ľ		3136	0.049	900 0		
	4000	0.001	3.4E-04			3136		0.00	2555	5 9E-00
	5000		3.4E-04		5.9E-07	3136		0.006		
	2000		3.4E-04	1.4E-05		3136		0.006		
	0009	0.0001	3.4E-04	1.4E-05	5.9E-07	3136	0.049	0.00		
TPA Smoke Pots							nursing pups			
	Distance					43				Daily Chronic Infake
	(m)	TPA Concentration (g/m3)		Intake Rate (m³/day)	(day)	(event/yr)	ED (yrs)	BW (kg)	AT (days)	Value (q/kq-dav)
			Daily IR	Hourly IR	Event IR					
Summer Foraging/Roosting Inhalation	ting Inhalation									
	3000		3.4E-04		5.9E-07	950	0.049	0.006		1.6E-05
	4000		3.4E-04				0.049	9000		
	2000		3.4E-04	1.4E-05	5.9E-07	950	0.049	900.0		
	2000	0.001	3.4E-04	1.4E-05	2.9E-07	950	0.049	9000		
	2000		3.4E-04	1.4E-05	5.9E-07	950	0.049	0.006		
	0009		3.4E-04	1.4E-05	5.9E-07	950	0.049	0.006		
	7000	0.0001	3.4E-04	1.4E-05	5.9E-07	950	0.049	0.006	2555	

Attachment J: Terephthalic Acid (TPA) Grenades and Smoke Pots - Supplemented Nursing Indiana Bats

TPA Smoke Grenade							supplemented nursing	nursing		
	Distance					13				Daily Chronic Intake
	(m)	TPA Concentration (g/m3)	Int	Intake Rate (m³/day)	ay)	(event/yr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
			Daily IR	Hourly IR	Event IR					
Summer Foraging/Roosting Inhalation	ing Inhalation									
	3000	6	3.4E-04	1.4E-05	5.9E-07	3136	0.074	0.007	2555	
	4000	0.005	3.4E-04	1.4E-05	5.9E-07	3136	0.074	0.007	2555	
	4000	0.002	3.4E-04	1.4E-05	5.9E-07	3136	0.074	0.007	2555	1.5E-08
	4000	0.001	3.4E-04	1.4E-05	5.9E-07	3136	0.074	0.007	2552	7.7E-09
	2000	0.0005	3.4E-04	1.4E-05	5.9E-07	3136	0.074	0.007	2555	
	2000	0.0002	3.4E-04	1.4E-05	5.9E-07	3136	0.074	0.007	2555	1.5E-09
	0009	0.0001	3.4E-04	1.4E-05	5.9E-07	3136	0.074	0.007	2555	7.7E-10
								, ,		
TPA Smoke Pots							supplemented nursing	nursing		
	Distance					Ħ	*****			Daily Chronic Intake
	(m)	TPA Concentration (g/m3)	Int	Intake Rate (m³/day)	ay)	(event/yr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
		ı	Daily IR	Hourly IR	Event IR					
Summer Foraging/Roosting Inhalation	ing Inhalation									
	0006	6	3.4E-04	1.4E-05	5.9E-07	056	0.074	0.007	2555	2.1E-05
	4000	0.005	3.4E-04	1.4E-05	5.9E-07	056	0.074	0.007	2555	
	0009	0.002	3.4E-04	1.4E-05	5.9E-07	096	0.074	0.007		
	2000	0.001	3.4E-04	1.4E-05	5.9E-07			0.007		2.3E-09
	2000	0.0005	3.4E-04	1.4E-05	5.9E-07	950		0.007	2555	
	0009	0.0002	3.4E-04	1.4E-05	5.9E-07	950	0.074	0.007		
	0002	0.0001	3.4E-04	1.4E-05	5.9E-07	950	0.074	0.007	2555	2.3E-10

Indiana bat supplemented nursing pup risk characterization for TPA exposure under Pasquill Category B.

TPA Smoke Grenades														
					"Chronic	Acute TRV	Chronic TRV	Acute		Chronic Doca	Acsido	Chronic	t	
	Distance		Daily Chronic Intake *Acute	*Acute Toxicity	Toxicity Value	Uncertainty	Uncertainty	TRV	Chronic	Adjusted TRV	Hazard	Hazard	Acute	Chronin
	(<u>E</u>)	Daily Acute Intake Value (g/m³)	Value (g/kg-day)	Value (g/m³)	(g/m³)	Adjustment	Adjustment	(g/m³)	TRV (g/m³)	(g/kg-day)	Quotient	Quotient	Effect	Effect
											ľ		l	
Summer Foraging/Roosting Inhalation	ting Inhalation													
	3000	9.0E+00	6.9E-05	8.6		-	30	8.6E+00	2.9E-01	9.7E-05	1.0E+00	7.1E-01	Yes	2
	4000	5.0E-03	3.8E-08	9.8	8.6	-	30	8.6E+00		9.7E-05	5.8E-04	4.0E-04	2	2
	4000	2.0E-03	1.5E-08	9.8	9.8	-	8	١.		9.7E-05	2.3E-04	1.6E-04	2	Ž
	4000	1.0E-03	7.7E-09		9.8	-	30	١.	L	9.7E-05	1.2E-04	7.9E-05	2	Š
	2000	5.0E-04	3.8E-09	8.6		-	30			9.7E-05	5.8E-05	4.0E-05	SZ.	Ž
	2000	2.0E-04	1.5E-09		8.6	-	30	<u> </u> _		9.7E-05	2.3E-05	1.6E-05	2	2
	0009	1.0E-04	7.7E-10	8.6	9.8	-	30	<u> </u>	2.9E-01	9.7E-05	1.2E-05	7.9E-06	2	2
*Acute critical effects are	necrosis and in	*Acute critical effects are necrosis and inflamation of the nasal cavity. Critical Study: Muse et al. 1995	cal Study: Muse et al. 15	195										
**Chronic critical effects	are edema of lu	**Chronic critical effects are edema of lungs and emphysema. Critical Study: Muse et al. 1995	dy: Muse et al. 1995									+		
TPA Smoke Pots														
					"Chronic	Acute TRV	Chronic TRV	Acute		Chronic Dose	Acute	, Pronie	l	
	Distance		Daily Chronic Intake 'Acute	*Acute Toxicity	Toxicity Value	Uncertainty	Uncertainty	TRV	Chronic	Adjusted TRV	Hazard	Hazard	Acute	Chronic
	<u>(E</u>	Daily Acute Intake Value (g/m³)	Value (g/kg-day)	Value (g/m³)	(g/m³)	Adjustment	Adjustment	(g/m³)	TRV (g/m³)	(g/kg-day)	Quotient	Quotient	Effect	Effect
							`							
Summer Foraging/Roosting Inhalation	ting Inhalation													
	3000	9.0E+00	2.1E-05	8.6	8.6	1	30	8.6E+00	2.9E-01	9.7E-05	1 0F+00	2.2F-01	Yes	S
	4000	5.0E-03	1.2E-08	8.6		-	30	L	L	9.7F-05		1 2F-04	Ž	2
	2000	2.0E-03	4.6E-09		9.8	F	30		L	9.7E-05	İ	4.8E-05	2	2
	2000	1.0E-03	2.3E-09	9.8	8.6	-	30			9.7E-05		2.4E-05	2	Ž
	2000	5.0E-04	1.2E-09	8.6		1	90	8.6E+00		9.7E-05	5.8E-05	1 2E-05	2	Š
	0009	2.0E-04	4.6E-10		9.8	1	30		L	9.7E-05	2.3E-05	4.8E-06	2	Š
	7000	1.0E-04	2.3E-10	9.8	9.8	1	30	8.6E+00	L	9.7E-05	1.2E-05	2.4E-06	2	2
*Acute critical effects are	necrosis and i	*Acute critical effects are necrosis and inflamation of the nasal cavity. Critical Study: Muse et al. 1995	cal Study: Muse et al. 19	395										
"Chronic critical effects	are edema of It	**Chronic critical effects are edema of lungs and emphysema. Critical Study: Muse et al. 1995	dy: Muse et al. 1995											

Attachment J: Terephthalic Acid (TPA) Grenades and Smoke Pots - Nursing Gray Bats

Gray bat nursing pups intake for TPA under Pasquill Category B.

TPA Smoke Grenade							nursing pups			
	Distance					43				Daily Chronic Intake
	Ê	TPA Concentration (g/m3)		Intake Rate (m³/day)	y	(event/yr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
			Daily IR	Hourly IR	Event IR					
Summer Foraging Inhalation	tion									
)	3000	6	3.4E-04	1.4E-05	5.9E-07	1568	0.055	0.0054		2.3E-05
	4000	0.005	3.4E-04	1.4E-05	5.9E-07	1568	0.055	0.0054		1.3E-08
	4000		3.4E-04		5.9E-07	1568	0.055	0.0054	3650	5.2E-09
:	4000	0.001	3.4E-04	1.4E-05	5.9E-07	1568	0.055	0.0054		2.6E-09
	2000	0.0005	3.4E-04	1.4E-05	5.9E-07	1568	0.055	0.0054		1.3E-09
	2000		3.4E-04		5.9E-07	1568	0.055	0.0054		5.2E-10
	0009		3.4E-04	1.4E-05	5.9E-07	1568	0.055	0.0054	3650	2.6E-10
	Dietance									Dally Chronic Intake
	E)	TPA Concentration (g/m3)		Intake Rate (m³/day)	(A)	EF event/yr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
			Daily IR	Hourly IR	Event IR					
Maternity Cave Inhalation	_									
		6	3.4E-04	1.4E-05	5.9E-07	3136		0.0054		4.6E-05
	4000	0.005	3.4E-04	1.4E-05	5.9E-07	3136	0.055	0.0054		2.6E-08
	4000	0.002	3.4E-04	1.4E-05	5.9E-07	3136	0.055	0.0054	3650	1.0E-08
	4000		3.4E-04	1.4E-05	5.9E-07	3136	0.055	0.0054		5.2E-09
	2000	0.0005	3.4E-04		5.9E-07	3136		0.0054		
	2000	0.0002	3.4E-04	1.4E-05	5.9E-07	3136				
	0009		3.4E-04	1.4E-05	5.9E-07	3136	0.055	0.0054	3650	5.2E-10
W. C. C. C. C. C. C. C. C. C. C. C. C. C.										

Gray bat nursing pups intake for TPA under Pasquill Category B.

TPA Smoke Pots							nursing pups			
	Distance					1				Daily Chronic Intake
	(m)	TPA Concentration (g/m3)	Ī	Intake Rate (m³/day)	day)	(event/yr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
			Daily IR	Hourly IR	Event IR					
Summer Foraging Inhalation										
	3000	6	3.4E-04	1.4E-05	5.9E-07	475	0.055	0.0054	3650	7.0E-06
	4000	0.005	3.4E-04	1.4E-05	5.9E-07	475	0.055	0.0054		3.9E-09
	2000	0.002	3.4E-04	1.4E-05	5.9E-07	475	0.055	0.0054		1.6E-09
	2000		3.4E-04	1.4E-05	5.9E-07	475	0.055	0.0054		7.8E-10
	2000	0.0005	3.4E-04	1.4E-05	5.9E-07	475	0.055	0.0054		3.9E-10
	0000	0.0002	3.4E-04	1.4E-05	5.9E-07	475	0.055	0.0054	3650	1.6E-10
	7000	0.0001	3.4E-04	1.4E-05	5.9E-07	475	0.055	0.0054	3650	7.8E-11
					-					
	Distance					EF				Daily Chronic Intake
	(m)	TPA Concentration (g/m3)	Ē	Intake Rate (m³/day)	day)	(event/yr)	ED (yrs)	BW (kg)	AT (days)	Value (q/kq-dav)
			Daily IR	Hourly IR	Event IR					
Maternity Cave Inhalation										
	3000		3.4E-04	1.4E-05	5.9E-07	950	0.055	0.0054	3650	1.4E-05
	4000	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	3.4E-04	1.4E-05	5.9E-07	950	0.055	0.0054	3650	
	5000		3.4E-04	1.4E-05	5.9E-07	950	0.055	0.0054	3650	3.1E-09
	5000		3.4E-04	1.4E-05	5.9E-07	950	0.055	0.0054	3650	1.6E-09
	2000		3.4E-04		5.9E-07	950	0.055	0.0054	3650	
	0009		3.4E-04		5.9E-07	950	0.055	0.0054	3650	3.1E-10
	7000	0.0001	3.4E-04	1.4E-05	5.9E-07	950	0.055	0.0054		1.6E-10

Gray bat nursing pup risk characterization for TPA exposure under Pasquill Category B.

TPA Smoke Grenade															
	Distance (m)	Pails Acute Intake Value Islam ³)		Daily Chronic Intake "Acute	*Acute Toxicity	Toxicity Value	Acute TRV Uncertainty Adjustment	Chronic TRV Uncertainty Adjustment	Acute TRV	Chronic TRV (a/m³)	Chronic Dose Adjusted TRV	Acute Hazard Quotient	Chronic Hazard Quotient	Acute	Chronic
				/ for five five five five five five five five			Î								
Summer Foraging Inhalation	tion														
	3000	9.0E+00		2.3E-05	9.8	9.8	-	90	8.6E+00		9.7E-05	1.0E+00	2.4E-01	Yes	2
	4000	5.0E-03		1.3E-08.	8.6	9.8	-	30	8.6E+00	2.9E-01	9.7E-05	5.8E-04	1.3E-04	S	Š
	4000	2.0E-03		5.2E-09	8.6	9.8	-	90	8.6E+00		9.7E-05		5.3E-05	2	Š
	4000	1.0E-03		2.6E-09	8.6	8.6	-	30	8.6E+00	2.9E-01	9.7E-05		2.7E-05	o _N	Š
	2000			1.3E-09	8.6	9.8		93	8.6E+00		9.7E-05		1.3E-05	§	No.
	2000	2.0E-04		5.2E-10	8.6	8.6	1	30	8.6E+00	2.9E-01	9.7E-05		5.3E-06	S	Š
	0009			2.6E-10	8.6	9.8	1	30	8.6E+00		9.7E-05	1.2E-05	2.7E-06	2	2
*Acute critical effects are necrosis and inflamation of the nasal cavity. Critical Study. Muse et al. 1995	necrosis and	inflamation of the nasal ca	avity. Critica	al Study. Muse et al. 19.	95										
**Chronic critical effects are edema of lungs and emphysema. Critical Study. Muse et al. 1995	are edema of It	ungs and emphysema. C	ritical Study	v: Muse et al. 1995											
						"Chronic	Acute TRV	Chronic TRV	Acute		Chronic Dose	Acute	Chronic		
	Distance			Daily Chronic Intake "Acute		Toxicity Value	Uncertainty	Uncertainty	TRV	Chronic	Adjusted TRV	Hazard	Hazard	Acute	Chronic
	(m)	Daily Acute Intake Value (g/m²)	ue (g/m²)	Value (g/kg-day)	Value (g/m²)	(g/m²)	Adjustment	Adjustment	(g/m²)	TRV (g/m²)	(g/kg-day)	Quotient	Guorient	Enect	Ellect
												-			:
Maternity Cave Inhalation							Ī	00	00.100	1	20 75 05	4 00.00	1000	700	No.
	3000			4.bE-U3	8.6		-	20	0.05+00		3.75-05		201	2	2 4
	4000			2.6E-08	8.6			OF.	8.55=+00		9.7E-UD		2.75-04	2	2
	4000			1.0E-08			-	93	8.6E+00		9.7E-05	1	1.15-04	2	2
	4000	1.0E-03		5.2E-09	8.6	8.6	-	30	8.6E+00		9.7E-05		5.3E-05	ટ	2
	2000			2.6E-09		8.6		30	8.6E+00	2.9E-01	9.7E-05	5.8E-05	2.7E-05	S S	2
	2000	2.0E-04		1.0E-09	8.6	9.8	-	30	8.6E+00	2.9E-01	9.7E-05		1.1E-05	Ž	2
	0009	1.0E-04		5.2E-10	8.6	8.6	-	30	8.6E+00	2.9E-01	9.7E-05	1.2E-05	5.3E-06	온	2
*Acute critical effects are	necrosis and	*Acute critical effects are necrosis and inflamation of the nasal cavity.		Critical Study: Muse et al. 1995	95										
**Chronic critical effects are edema of lungs and emphysema. Critical Study. Muse et al. 1995	are edema of I	ungs and emphysema. C	Critical Stud	y: Muse et al. 1995											

Gray bat nursing pup risk characterization for TPA exposure under Pasquill Category B.

TPA Smoke Pots														
					"Chronic	Acute TRV	Chronic TRV	Acute		Chronic Dose	Verify	1	\dagger	1
	Distance		Daily Chronic Intake *Acute	*Acute Toxicity	Toxicity Value	Uncertainty	Uncertainty	TR	Chronic	Adjusted TRV	Hazard	Hazard	Acreto	Chronic
	(m)	Daily Acute Intake Value (g/m³)	7) Value (g/kg-day)	Value (g/m³)	(g/m³)	Adjustment	Adjustment	(g/m³)	TRV (g/m³)	(g/kq-day)	Quotient	Quotient	Effect	Effect
Summer Foraging Inhalation	tion												1	
	3000	9.0E+00	7.0E-06	8.6	8.6	-	30	8 6F+00	2 9F-01	9 75.05	1 05+00	7 35 00	20%	N.
	4000	5.0E-03	3.9E-09	8.6	8.6		30	8.6E+00	2.9E-01	9.7E-05		4 0F-05	2	2 2
	2000	2.0E-03	1.6E-09	8.6	8.6	-	30	8 6F+00	2 9F-01	9.7E.05		1.01	2 2	2 2
	2000	1.0E-03	7.8E-10	8.6	89	-	30	8 6F+00	2 9F-01	9.75.05		41 A	2 2	2 2
	2000	5.0E-04	3.9E-10	8.6	8.6	-	30	8 6F+00	2 9F-01	9.7E-05			2 2	2
	0009	2.0E-04	1.6E-10	8.6	8.6	-	30	8.6E+00	2.9E-01	9.7E-05	2.3E-05		2 2	2 2
	2000	1.0E-04	7.8E-11	8.6	8.6	-	30	8.6E+00	2.9E-01	9.7E-05			2	S
*Acute critical effects are	necrosis and it	*Acute critical effects are necrosis and inflamation of the nasal cavity. Critical Study: Muse et al. 1995	itical Study: Muse et al. 15	195										
**Chronic critical effects	are edema of lu	**Chronic critical effects are edema of lungs and emphysema. Critical Study: Muse et al. 1995	tudy Muse et al 1995											
	Distance		Daily Chronic Intake *Acute	*Acute Toxicity	"Chronic Toxicity Value	Acute TRV Uncertainty	Chronic TRV Uncertainty	Acute TRV	Chronic	Chronic Dose	Acute	Chronic	4	1
	(m)	Daily Acute Intake Value (g/m³)		Value (g/m³)	(g/m³)	Adjustment	Adjustment	(g/m³)	TRV (a/m³)	(a/ka-dav)	Quotient	Quotient	Effect	
Maternity Cave Inhalation														
	3000	9.0E+00	1.4E-05	8.6	8.6	-	30	8 6E+00	2 9F-01	9 7F-05	1 OF+00	1.5E-01	Vac	O.N.
	4000	5.0E-03	7.8E-09	8.6	8.6	-	90	8 6E+00	İ	9.7E-05			3 2	2 2
	2000	2.0E-03	3.1E-09		8.6	-	90	8 6F+00		9.7F-05			2 2	2 2
	2000	1.0E-03	1.6E-09	9.6	8.6	1	30	8.6E+00		9.7E-05		1 6E-05	2	Z
# # 1 To 10	2000	5.0E-04	7.8E-10		8.6	-	30	8.6E+00		9.7E-05			2	2
	0009	2.0E-04	3.1E-10	9.8	8.6	1	30	8 6F+00		9.74-05			2 2	2 2
	2000	1.0E-04	1.6E-10	8.6	8.6	1	30	8.6E+00		9.7E-05	1.2E-05	-	2 2	2 2
													2	
*Acute critical effects are	necrosis and in	*Acute critical effects are necrosis and inflamation of the nasal cavity. Critical Study: Muse et al. 1995	ritical Study: Muse et al. 15	195										
**Chronic critical effects	are edema of IL	**Chronic critical effects are edema of lungs and emphysema. Critical Study: Muse et al. 1995	tudy: Muse et al. 1995											
					1	T								_

Attachment J: Terephthalic Acid (TPA) Grenades and Smoke Pots - Supplemented Nursing Gray Bats

Gray bat supplemented nursing intake for TPA under Pasquill Category B.

TPA Smoke Grenade							supplemented nursing	nursing		
	Distance					4				Daily Chronic Intake
	(m)	TPA Concentration (g/m3)	_	ntake Rate (m³/day)	ay)	(event/yr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
			Daily IR	Hourly IR	Event IR					
Summer Foraging Inhalation	ition									
	3000	6	3.4E-04	1.4E-05	5.9E-07	1568	0.123	0.0071	3650	4.0E-05
	4000	0.005	3.4E-04		5.9E-07	1568	0.123	0.0071	3650	2.2E-08
	4000	0.002	3.4E-04	1.4E-05	5.9E-07	1568	0.123	0.0071	3650	8.8E-09
	4000	0.001	3.4E-04	1.4E-05	5.9E-07	1568	0.123	0.0071		4.4E-09
	2000	0.0005	3.4E-04	1.4E-05	5.9E-07	1568	0.123	0.0071	3650	2.2E-09
	2000	0.0002	3.4E-04	1.4E-05	5.9E-07	1568	0.123	0.0071	3650	8.8E-10
	0009	0.0001	3.4E-04	1.4E-05	5.9E-07	1568	0.123	0.0071	3650	4.4E-10
	Distance									Daily Chronic Intake
	(m)	TPA Concentration (g/m3)		Intake Rate (m³/day)	ay)	EF event/yr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
			Daily IR	Hourly IR	Event IR					
Maternity Cave Inhalation	Ļ									
	3000	6	3.4E-04	1.4E-05	5.9E-07	3136	0.123	0.0071		7.9E-05
	4000	0.005	3.4E-04		5.9E-07	3136	0.123	0.0071		4.4E-08
	4000	0.002	3.4E-04	1.4E-05	5.9E-07	3136	0.123	0.0071	3650	1.8E-08
	4000	0.001	3.4E-04	1.4E-05	5.9E-07	3136	0.123	0.0071	3650	8.8E-09
	5000	0.0005	3.4E-04	1.4E-05	5.9E-07	3136	0.123	0.0071		4.4E-09
	2000		3.4E-04	1.4E-05	5.9E-07	3136	0.123	0.0071		1.8E-09
	0009	0.0001	3,4E-04	1.4E-05	5.9E-07	3136	0.123	0.0071	3650	8.8E-10

Gray bat supplemented nursing intake for TPA under Pasquill Category B.

TPA Smoke Pots			-					supplemented nursing	nursing		
			\vdash								
	Distance						Ш				Daily Chronic Intake
	Œ	TPA Concentration (g/m3)	/m3)	Inta	Intake Rate (m³/day)	day)	(event/yr)	ED (yrs)	BW (kg)	AT (days)	Value (q/kq-day)
			-	Daily IR	Hourly IR	Event IR					
Summer Foraging Inhalation											
	3000	6		3.4E-04	1.4E-05	5.9E-07		0.123	0.0071	3650	1.2E-05
	4000			3.4E-04	1.4E-05		475	0.123	0.0071		•
	2000	0.002	_	3.4E-04	1.4E-05	5.9E-07	475	0.123	0.0071	3650	
	2000		-	3.4E-04	1.4E-05	5.9E-07	475	0.123	0.0071	3650	
	2000			3.4E-04	1.4E-05	5.9E-07	475	0.123	0.0071	3650	
	0009		-	3.4E-04	1.4E-05	5.9E-07	475	0.123	0.0071	3650	
	7000	0.0001		3.4E-04	1.4E-05	5.9E-07	475	0.123	0.0071	3650	
	Distance						H				Daily Chronic Intake
	Œ	TPA Concentration (g/m3)	/m3)	Inta	Intake Rate (m³/day)	day)	(event/yr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
				Daily IR	Hourly IR	Event iR					
Maternity Cave Inhalation	į										
	3000			3.4E-04	1.4E-05	5.9E-07	950	0.123	0.0071	3650	2.4E-05
	4000		-	3.4E-04	1.4E-05	5.9E-07	950	0.123	0.0071	3650	1.3E-08
	2000		-	3.4E-04	1.4E-05	5.9E-07	950	0.123	0.0071	3650	
	2000			3.4E-04	1.4E-05	5.9E-07	950	0.123			
	2000			3.4E-04	1.4E-05	5.9E-07	950	0.123	0.0071	3650	1.3E-09
	0009		-	3.4E-04	1.4E-05	5.9E-07	950	0.123	0.0071	3650	
	7000	0.0001	\dashv	3.4E-04	1.4E-05	5.9E-07	950	0.123	0.0071	3650	2.7E-10

Gray bat supplemented nursing risk characterization for TPA exposure under Pasquill Category B.

TPA Smoke Grenade														
	Distance (m)	Daily Acute Intake Value (g/m³)	Daily Chronic Intake *Acute	"Acute Toxicity Value (g/m³)	"Chronic Toxicity Value (g/m³)	Acute TRV Tucertainty Adjustment	Chronic TRV Uncertainty Adjustment	Acute TRV (g/m³)	Chronic TRV (g/m³)	Chronic Dose Adjusted TRV (g/kg-day)	Acute Hazard Quotient	Chronic Hazard Quotient	Acute Effect	Chronic Effect
			_											
Summer Foraging Inhalation	tion													
	3000	9.0E+00	4.0E-05	8.6	8.6	1	30	8.6E+00		9.7E-05	1.0E+00	4.1E-01	Yes	Š
	4000	5.0E-03	2.2E-08	8.6	8.6	1	30	8.6E+00	2.9E-01	9.7E-05	5.8E-04	2.3E-04	2	Š
	4000		8.8E-09	8.6	8.6	1	30	8.6E+00		9.7E-05	2.3E-04	9.1E-05	운	Š
	4000		4.4E-09	8.6	9.8	-	30	8.6E+00		9.7E-05	1.2E-04	4.5E-05	ટ	Š
	2000	5.0E-04	2.2E-09	8.6	8.6	-	30	8.6E+00		9.7E-05	5.8E-05	2.3E-05	2	^o Z
	2000	2.0E-04	8.8E-10	8.6	9.8	-	30	8.6E+00		9.7E-05	2.3E-05	9.1E-06	£	ટ
	0009	1.0E-04	4.4E-10	8.6	8.6	1	30	8.6E+00	2.9E-01	9.7E-05	1.2E-05	4.5E-06	S	2
2		10 11 11 11 11 11 11 11 11 11 11 11 11 1	2	30										
Acute critical effects are	necrosis and	Acute critical effects are necrosis and inflamation of the hasal cavity. Critical Study, muse et al. 1993	lical Study. Muse et al. 13	250							+			
**Chronic critical effects	are edema of I	**Chronic critical effects are edema of lungs and emphysema. Critical Study: Muse et al. 1995	udy: Muse et al. 1995								-	-		
				*************	Tewielter	Acute TRV	Chronic TRV	Acute	ohaaalo	Chronic Dose	Acute	Chronic	, and	Chronic
	Distance (m)	Daily Acute Intake Value (g/m³)	Value (g/kg-day) Value		(g/m³)	Adjustment	Adjustment	(g/m³)	TRV (g/m³)	(g/kg-day)	Quotient	Quotient	Effect	Effect
			L											
Maternity Cave Inhalation														
	3000	9.0E+00	7.9E-05	8.6	8.6	1	30	8.6E+00		9.7E-05	1.0E+00	8.2E-01	Yes	2
	4000		4.4E-08	8.6	8.6	-	8	8.6E+00	2.9E-01	9.7E-05	5.8E-04	4.5E-04	2	Š
	4000	2.0E-03	1.8E-08	8.6	8.6	-	30	8.6E+00			2.3E-04	1.8E-04	ટ	2
	4000	1.0E-03	8.8E-09	8.6	8.6	-	30	8.6E+00	2.9E-01		1.2E-04	9.1E-05	£	_S
	2000	5.0E-04	4.4E-09	8.6	8.6	-	93	8.6E+00			5.8E-05	4.5E-05	S	S N
	2000	2.0E-04	1.8E-09		9.8	-	30	8.6E+00		9.7E-05	2.3E-05	1.8E-05	No	S _N
	0009		8.8E-10		8.6	-	30	8.6E+00	2.9E-01	9.7E-05	1.2E-05	9.1E-06	S.	S
*Acute critical effects are	necrosis and	Acute critical effects are necrosis and inflamation of the nasal cavity. Critical Study: Muse et al. 1995	itical Study: Muse et al. 19	395										
**Chronic critical effects	are edema of I	**Chronic critical effects are edema of lungs and emphysema. Critical Study: Muse et al. 1995	udy: Muse et al. 1995											

Gray bat supplemented nursing risk characterization for TPA exposure under Pasquill Category B.

TPA Smoke Pots														
					C. P. P. P. P. P. P. P. P. P. P. P. P. P.									
	Distance	-	Daily Chronic Infake *Acute	*Acute Toxicity	Ţ	Acute 1KV	Chronic TRV	Acute		Chronic Dose	Acute	Chronic		
	(m)	Daily Acute Intake Value (g/m³)	_			Adjustment	Adjustment	(a/m)	TRV (a/m³):	Adjusted 1KV (a/kg-day)	Mazard	Hazard	Acute	Chronic
										(Am Suis)	-	doorie it	בוופר	בוופנו
Summer Foraging Inhalation	ation												-	
	3000	9.0E+00	1.2E-05	8.6	86		30	8 SE+OO	2 OF 04	20 75 0	00.100	1010	-	
	4000		6.6E-09		80	-	30	8 6F+00		9.75-05	5.0E+00	1.2E-01	Tes No	2 2
	2000		2.7E-09	8.6	8		30	8 6F+00		9 75 05	2010	2.9E-03	2 2	2 2
	5000		1.3E-09	8.6			30	8 6F+00	ŀ	9.7E-05	1 2E 04	4 AE OF	2 2	0 2
	2000	5.0E-04	6.6E-10	8.6		-	30	8 6E+00	2 9F-01	9.7E-05	5 85.05	8 9F-05	2 2	2 2
	0009		2.7E-10	8.6	8.6	-	30	8.6E+00	2.9E-01	9.7E-05	235-05	2.95-00	2 2	2 2
	7000	1.0E-04	1.3E-10	9.8	9.8	1	30	8.6E+00	2.9E-01	9.7E-05	1 2F-05	1 4F-06	2 2	2
											2	3	2	2
*Acute critical effects are	e necrosis and	Acute critical effects are necrosis and inflamation of the nasal cavity. Critical Study: Muse et al.	!	1995									+	
**Chronic critical effects	are edema of I	**Chronic critical effects are edema of lungs and emphysema. Critical Study Muse et al. 1995	: 1											
			2000								_			
	Distance		Daily Chronic Intake *Acute	*Acute Toxicity	Toxicity Value	Acute TRV	Chronic TRV	Acute	1	Chronic Dose	Acute	Chronic		
	(m)	Daily Acute Intake Value (g/m³)			(a/m²)	Adjustment	Adjustment	(a/w)	TRV (a/m³)	Adjusted TRV	Mazard	Hazard	Acute	Chronic
										(fan Suss)		duotient		FILECT
Maternity Cave Inhalation	c										+			
	3000		2.4E-05	8.6	8.6	-	30	8 6F+00	2 9F-01	9.75.05	1 05+00	2 55 04	202	12
	4000		1.3E-08	8.6		-	30	8.6E+00	2.9E-01	9.75-05	5 BE-04	1 4F-04	8 2	2 2
	2000		5.3E-09			-	30	8.6E+00	2.9E-01	9.7E-05	2.3F-04	5.5F-05	2	2
	2000		2.7E-09	8.6	8.6	-	30	8.6E+00	2.9E-01	9.7E-05	1 2F-04	2 RF-05	2 2	2 2
	2000	5.0E-04	1.3E-09			-	3	8.6E+00		9.7E-05	5 8F-05	1 4F-05	2 2	2
	0009		5.3E-10		8	-	30	8.6E+00		9.7E-05	2.3E-05	5.5E-06	2 2	2 2
	7000	1.0E-04	2.7E-10	8.6		-	30	8.6E+00	2.9E-01	9.7E-05	1.2E-05	2.8E-06	2	2 2
Acute critical effects are	e necrosis and	"Acute critical effects are necrosis and inflamation of the nasal cavity. Critical Study: Muse et al.	_	1995										
*Chronic critical effects	are edema of l	**Chronic critical effects are edema of lungs and emphysema. Critical Study: Muse et al. 1995	dy: Muse et al. 1995										+	

Attachment J: Terephthalic Acid (TPA) Grenades and Smoke Pots - Juvenile Bald Eagles

TPA Smoke Grenade							juvenile			
	Distance					盟				Daily Chronic Intake
	(m)	TPA Concentration (g/m3)		Intake Rate (m³/day)	(ay)	(event/yr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
			Daily IR	Hourly IR	Event IR					
Summer Inhalation										
	3000	0	3.4E-04	1 1.4E-05	5.9E-07		2	4.5		
	4000	0.005	3.4E-04	1.4E-05	5.9E-07	2242	2	4.5		2.3E-10
-	4000	0.002	3.4E-04	1.4E-05	5.9E-07	2242	2	4.5		9.2E-11
	4000	0.001	3.4E-04	1.4E-05	5.9E-07	2242	2	4.5	12775	4.6E-11
	2000	0.0005	3.4E-04	1.4E-05	5.9E-07	2242	2	4.5		2.3E-11
	2000	0.0002	3.4E-04	1.4E-05	5.9E-07	2242	2	4.5		9.2E-12
	0009	0.0001	3.4E-04	1.4E-05	5.9E-07	2242	2	4.5	12775	4.6E-12
TPA Smoke Pot										
	Distance					扫				Daily Chronic Intake
	Œ	TPA Concentration (g/m3)		Intake Rate (m³/day)	day)	(event/yr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
			Daily IR	Hourly IR	Event IR					
Summer Inhalation										
	3000	6	3.4E-04	4 1.4E-05	5.9E-07	950	2	4.5		
	4000	0.005	3.4E-04	4 1.4E-05	5.9E-07		2	4.5		
	2000	0.002	3.4E-04	4 1.4E-05	5.9E-07	056	2	4.5		3.9E-11
	2000		3.4E-04		5.9E-07		2	4.5		
	2000	0.0005	3.4E-04	4 1.4E-05	5.9E-07	950	2	4.5		9.7E-12
	0009		3.4E-04	4 1.4E-05	5.9E-07	950	2	4.5		
	7000	0.0001	3.4E-04	4 1.4E-05	5.9E-07	950		4.5	12775	1.9E-12

Bald eagle juvenile risk characterization for TPA exposure under Pasquill Category B.

TPA Smoke Grenade			r												
	Distance (m)	Daily Acute Intake Value (rim)		Daily Chronic Intake "Acute	*Acute Toxicity	"Chronic Toxicity Value	Acute TRV Uncertainty	Chronic TRV Uncertainty	Acute TRV	Chronic	Chronic Dose Adjusted TRV	Acute Hazard	Chronic Hazard	Acute	Chronic
		mile a supplied of the supplind of the supplied of the supplied of the supplied of the supplin	-	value (y/kg-day)	vaiue (g/m.)	(g/m²)	Adjustment	Adjustment	(g/m²)	TRV (g/m³)	(g/kg-day)	Quotient	Quotient	Effect	Effect
Summer Inhalation															
	3000	9.0E+00		4.1E-07	8.6	8.6	33	OBO	2 7E 01	0 05 03	2000	200.04	747.04	,	
	4000			2.3E-10	8.6	8.6	32	098	2.7E-01	9.0E-03	300-00	1 05 02	1.40-01	S	2
	4000	2.0E-03		9.2E-11	8.6	80	35	096	2.7E-04	9.0C-03	300-00	7 45 02	20.00	2 2	2
	4000	1.0E-03		4.6E-11	8.6	80	32	196	2.7E-01	9.00	3000	2 75 03	3.05-03	2 2	2
	2000			2.3E-11	8.6		32	096	2.7E-04	9.00	3.05-00	3.70-03	1.05-05	2 2	2
	2000	2.0E-04		9.2E-12	8.6	8.6	33	096	2.7E-01	9.0E-03	3.05.06	7 45 04	00-100.7	2 2	2 :
	0009	1.0E-04		4.6E-12	8.6	8.6	32	096	2.7E-01	9.0E-03	3.0E-06	3.7E-04	1.5E-06	2 2	2 2
A contractition of the At														2	2
**Chronic critical effects	are edema of l	*Chronic critical effects are necrosis and initiamation of the nasal cavity. Critical Study: Muse et al. 1995 **Chronic critical effects are edema of lunas and emphysema. Critical Study: Muse et al. 1905	incal Study	Muse et al. 19.	95				:					-	
		Section of the sectio	rioni Cina	. INITIAL OF AL. 1999											
			+												
TDA Smoke Det															
174 STIONE POL															
	, in the second					"Chronic	Acute TRV	Chronic TRV	Acute		Chronic Dose	Acute	Chronic	1	
	UISTANCE (m)	Daily Acute Intake Value (g/m³)		Daily Chronic Intake 'Acute Value (q/kq-day)	*Acute Toxicity Value (a/m³)	Toxicity Value	Uncertainty	Uncertainty	TRV	Chronic	Adjusted TRV	Hazard	Hazard	Acute	Chronic
			┺				The state of the s	Aujustine	(ging)	i KV (g/m)	(g/kg-day)	Guotient	Quotient	Effect	Effect
Summer Inhalation															
	3000			1.8E-07	8.6	86	32	OBO	275.04	0 00 03	30 10 0	200.00	Lou		
	4000			9.7E-11	8.6	8.6	32	096	27F-01		3050	3.3E+01	20-30-02	Se Les	2
	2000			3.9E-11	8.6	8.6	32	096	2.7F-01	1	20-10.2 20-10.2	7.4E-03	3.2E-U3	2 2	2
	2000			1.9E-11	8.6	8.6	32	096	27F-01		30F08	3 75 03	90 TA 8	2 2	2 1
	2000			9.7E-12	8.6	8.6	32	096	2 7E-01		305.08	4 00 03	90.00	2 2	2
	0009			3.9E-12	8.6	8.6	32	096	2 7E-01		30.00	7 45 04	3.2E-00	2 2	2
	7000	1.0E-04		1.9E-12	8.6	8.6	32	096	2.7E-01	9.0E-03	3.0E-06	3.7F-04	6.5E-07	2 2	2 2
													200		2
Acute critical effects are	necrosis and	Acute critical effects are necrosis and inflamation of the nasal cavity. Critical Study. Muse et al. 1995	rity. Critica	Il Study. Muse et al. 190	95										
Chronic childal ellects	are edema of	Criticalic critical effects are edema of lungs and emphysema. Critical Study. Muse et al. 1995	Itical Study	Muse et al. 1995											

Attachment J: Titanium Dioxide Grenades - Nursing Indiana Bats

Indiana bat nursing pup intake for titanium dioxide under Pasquill Category E.

									:	
				•						
	Distance					Ш				
	Œ	Concentration (g/m3)	In	intake Rate (m³/day)	day)	(event/yr)	ED (vrs)	BW (kg)	AT (dave)	Value (alka dau)
		_	Daily IR	Hourly IR	Fvant IR				12.	and (ging day)
Summer Foraging/Roosting Inhalation	ing Inhalation									
	100	0.01	3 AE-04	4 AE OE	20.00	ç				
	500	1000	5		3.8E-U/	48	0.049	0.006	2555	9.0E-10
	38	0.005	3.4E-04	1.4E-05	5.9E-07	48	0.049	9000	ישבר	1 EC 4
	200	0.002	3.4E-04	ľ	5, QE 07	9		2000		4.0E-10
	5	7000			20.0	₽		0.000	CCC7	1.8E-10
	3	0.001	3.45-04	1.4E-05	5.9E-07	48	0.049	9000	2555	9 OE 41
	1000	0.0005	3.4E-04	1.4E-05	5 9F-07	48	0000	9000		1000
	1400	0 0002	A AF_OA	Ĺ	5 00 07	2 5	200	0.000	CCC7	4.0E-1
	0007	, , , ,	5		3.8E-07	40	0.049	900.0	2555	1.8E-1:
	1800	0.0001	3.4E-04	1.4E-05	5.9E-07	48	0.049	9000		Q 0E 12
										9.00-17
								_		
							+			
							-			

Algeria.

Indiana bat nursing pup risk characterization for titanium dioxide exposure under Pasquill Category E.

	Distance (m)	Distance Daily Acute Intake Value Daily Chronic Intake "Acute (m) Value (orko-dav) Value	Daily Chronic Intake	: Toxicity e (a/m³)	"Chronic Toxicity Value	Acute TRV Uncertainty Adjustment	Chronic TRV Uncertainty Adjustment	Acute TRV (g/m³)	Chronic TRV (g/m³)	Chronic Dose Adjusted TRV (g/kg-day)	Acute Hazard Quotient	Chronic Hazard Quotient	Acute	Chronic
								_						
Summer Foraging Inhalation	tion													
	100	1.0E-02	9.0E-10	0.25	0.25	-	160	2.5E-01	1.6E-03	5.3E-07	4.0E-02	1.7E-03	No No	S N
	300	5.0E-03	4.5E-10	0.25	0.25	-	160	2.5E-01	1.6E-03	5.3E-07	2.0E-02	8.6E-04	S	2
	200		1.8E-10	0.25	0.25	-	160	2.5E-01	1.6E-03	5.3E-07	8.0E-03	3.4E-04	8	₽!
	7007	1.0E-03	9.0E-11	0.25	0.25	-	091	2.5E-01	1.6E-03	5.3E-07	4.0E-03	1.7E-04	2	Š
	1000	5.0E-04	4.5E-11	0.25		-	160	2.5E-01	1.6E-03	5.3E-07	2.0E-03	8.6E-05	No	ş
	1400	2.0E-04	1.8E-11	0.25	0.25	-	160	2.5E-01	1.6E-03	5.3E-07	8.0E-04	3.4E-05	2	ટ્ટ
	1800	1.0E-04	9.0E-12	0.25	0.25	-	160	2.5E-01	1.6E-03	5.3E-07	4.0E-04	1.7E-05	ટ	2
*Acute toxicity value assu	imed equal to	Acute toxicity value assumed equal to unadjusted chronic LOAEL. Acute critical effects are resp	Acute critical effects a		ratory irritation. Critical Study: Lewis 1992	Lewis 1992							-	
**Chronic critical effects :	are respiratory	*Chronic critical effects are respiratory irritation. Critical Study: Lewis 1992	ewis 1992.											
												_		

Attachment J: Titanium Dioxide Grenades - Supplemented Nursing Indiana Bats

Indiana bat supplemented nursing pup intake for titanium dioxide under Pasquill Category E.

	•				Ħ				Daily Chronic Intake
Summer Foraging/Roosting Inhalation 100 300 300 700 1000	Concentration (g/m3)	Inta	ntake Rate (m³/day)	2	(event/yr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
Summer Foraging/Roosting Inhalation 100 300 300 700 1000		Daily IR	Hourly IR	Event IR					
100 300 500 700 1000									
300 500 700 1000	0.01	3.4E-04	1.4E-05	5.9E-07	48	0.074	0.007	2555	1.2E-09
700 1000	0.005	3.4E-04	1.4E-05	5.9E-07	48	0.074	0.007	2555	5.9E-10
1000	0.002	3.4E-04	1.4E-05	5.9E-07	48	0.074	0.007	2555	2.3E-10
1000	0.001	3.4E-04	1.4E-05	5.9E-07	48	0.074	0.007	2555	
0077	0.0005	3.4E-04	1.4E-05	5.9E-07	48	0.074	0.007	2555	
1700	0.0002	3.4E-04	1.4E-05	5.9E-07	48	0.074	0.007	2555	2.3E-11
1800	0.0001	3.4E-04	1.4E-05	5.9E-07	48	0.074	0.007	2555	1.2E-11

Indiana bat supplemented nursing pup risk characterization for titanium dioxide exposure under Pasquill Category E.

	Distance (m)	Dally Acute Intake Valu (g/m³)	Distance Dally Acute Intake Value Daily Chronic Intake "Acut (m) (g/m³) Value (g/kg-day) Val	te Toxicity	**Chronic Toxicity Value	Acute TRV Uncertainty Adjustment	Chronic TRV Uncertainty	Acute TRV	Chronic	Chronic Dose Adjusted TRV	Acute Hazard	Chronic Hazard	Acute	Chronic
					,		and an arrive	1	1 11/61	(ging-uay)	duonent	Cuotient	Епест	Епест
Summer Foraging Inhalation	ion							1						
	100	1.0E-02	1.2E-09	0.25	0.25	-	160	2 55-04	1 80 03	5 35 07	20 10 1	0000	1	
	300	5.0E-03	5.9E-10	0.25	0.25	-	200	255.01	1.01	0.35-07	4.0C-0Z	2.25-03	2	2
	200	2 OF-03	235 40	300	200		3	2.30-01	20-00-	2.3E-U/	70-207	1.15-03	S S	S No
	2007		2.30-10	0.43	07.0	-	160	2.5E-01	1.6E-03	5.3E-07	8.0E-03	4.4E-04	ž	Š
	007	1.0E-03	1.2E-10	0.25	0.25	-	160	2.5E-01	1.6E-03	5.3E-07	4.0E-03	2.2F-04	Š	Ž
	1000	5.0E-04	5.9E-11	0.25	0.25	-	160	2.5F-01	1 6F-03	5 3E-07	2 OF 03	1 15.04	2 2	2
	1400	2.0E-04	2.3E-11	0.25	0.25		160	2.5E-01	1 65-03	5.3E-07	2.0C-03	4 45 05	2 2	ON S
	1800	1.0E-04	1.2E-11	0.25	0.25	-	160	2.5F-01	1 65-03	5 35-07	A OF OA	2 20 05	2 2	2
									2	0.00	10.10	Z.ZE-U3	2	2
*Acute toxicity value assumed equal to unadjusted chronic LOAEL Acute critical effects are resp	med equal to L	unadjusted chronic LOAE	Acute critical effects an		rathory irritation Ceitinal Study: Leuis 1000	1000								
**Chronic critical effects are respiratory irritation. Critical Study: 1 puis 4000	re recoiratory	irritation Critical Study	I main 4000		ourcal ottony.	766 SIMAT								
		mindion. Office Olddy.	Lewis 1332		_					_				
	_	_												

Attachment J: Titanium Dioxide Grenades - Nursing Gray Bats

Gray bat nursing pup intake for titanium dioxide under Pasquill Category E.

	Distance (m)	Concentration (a/m3)	h	Infake Rafe (m³/dav)	avi	EF	ED (vrs)	BW (ka)	AT (davs)	Daily Chronic Intake Value (o/kg-dav)
			Daily IR	Hourly IR	Event IR					1 .
Summer Foraging Inhalation	ation									-
	100	0.01	3.4E-04	1.4E-05	5.9E-07	24	0.055	0.0054	3650	3.9E-10
	300	0.005	3.4E-04	1.4E-05	5.9E-07	24	0.055	0.0054	3650	2.0E-10
	200	0.002	3.4E-04	1.4E-05	5.9E-07	24	0.055	0.0054	3650	7.9E-11
	700	0.001	3.4E-04	1.4E-05	5.9E-07	24	0.055	0.0054	3650	3.9E-11
	1000	0.0005	3.4E-04	1.4E-05	5.9E-07	24	0.055	0.0054	0996	2.0E-11
	1400	0.0002	3.4E-04	1.4E-05	5.9E-07	24	0.055	0.0054	0598	7.9E-12
	1800	0.0001	3.4E-04	1.4E-05	5.9E-07	24	0.055	0.0054	3650	3.9E-12

Gray bat nursing pup risk characterization for titanium dioxide exposure under Pasquill Category E.

Chronic		Š	Š	ž	S	8 2	ž	2				
Chr	L	_				L	_		!	L	L	L
Acute Effect		2	2	2	ટ	2	2	2				
Chronic Hazard Quotient		7.5E-04	3.8E-04	1.5E-04	7.5E-05	3.8E-05	1.5E-05	7.5E-06				
Acute Hazard Quotient		4.0E-02	2.0E-02		4.0E-03	2.0E-03	8.0E-04	4.0E-04				
Chronic Dose Adjusted TRV (g/kg-day)		5.3E-07	5.3E-07	5.3E-07	5.3E-07	5.3E-07	5.3E-07	5.3E-07				
Chronic TRV (g/m³)		1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03				
Acute TRV (g/m³)		2.5E-01	2.5E-01	2.5E-01	2.5E-01	2.5E-01	2.5E-01	2.5E-01				i
Chronic TRV Uncertainty Adjustment		160	160	160	160	160	160	160				
Acute TRV Uncertainty Adjustment		-	1	1	1	1	1	ļ		Lewis 1992		
"Chronic Toxicity Value (g/m³)		0.25	0.25	0.25	0.25	0.25	0.25	0.25		piratory irritation. Critical Study: Lewis 1992		
"Acute Toxicity Value (g/m³)		0.25	0.25	0.25	0.25	0.25	0.25	0.25		e respiratory irritati		
Daily Acute Intake Value Daily Chronic Intake *Acul		3.9E-10	2.0E-10	7.9E-11	3.9E-11	2.0E-11	7.9E-12	3.9E-12		Acute critical effects ar	ewis 1992	
e Value										LOAEL.	Study: L	
Daily Acute Intakı (g/m³)		1.0E-02	5.0E-03	2.0E-03	1.0E-03	5.0E-04	2.0E-04	1.0E-04		nadjusted chronic	rritation. Critical &	
Distance C	tion	100	300	200	002	1000	1400	1800		imed equal to u.	are respiratory i	
	Summer Foraging Inhalation									*Acute toxicity value assumed equal to unadjusted chronic LOAEL. Acute critical effects are resi	**Chronic critical effects are respiratory irritation. Critical Study: Lewis 1992	

Attachment J: Titanium Dioxide Grenades - Supplemented Nursing Gray Bats

	Distance					L H				Daily Chronic Intake
	(E)	Concentration (g/m3)	lnt.	Intake Rate (m³/day)	(day)	(event/yr)	ED (yrs)	BW (kg)	AT (davs)	
			Daily IR	Hourty IR	Event IR					
Summer Foraging Inhalation	ation									
	\$	0.01	3.4E-04	1.4E-05	5 9F-07	24	0.123	0.0074	3650	R 7E 40
	300	0.005	3.4E-04	1.4E-05			0.123	0.0071	3650	3.4E-10
	500	0.002	3.4E-04				0 123	0.007	3650	135.10
	7007	0.001	3.4E-04	ľ				0.0071	3650	6.7E-11
	1000	0.0005	3.4E-04					0 0071	3650	3.4E.11
	1400	0.0002	3.4E-04	ľ		24	0.123	0.0071	3650	1 3E-11
	1800	0.0001	3.4E-04	1.4E-05		24	0.123	0.0071	3650	6.7F-12
						_	_		_	

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Gray bat supplemented nursing pup risk characterization for titanium dioxide exposure under Pasquill Category E.

160 2.5E-01 1.6E-03 5.3E-07 4.0E-02 1.3E-03 160 2.5E-01 1.6E-03 5.3E-07 2.0E-02 6.4E-04 160 2.5E-01 1.6E-03 5.3E-07 8.0E-03 2.6E-04 160 2.5E-01 1.6E-03 5.3E-07 2.0E-03 1.3E-03 160 2.5E-01 1.6E-03 5.3E-07 2.0E-03 6.4E-05 160 2.5E-01 1.6E-03 5.3E-07 8.0E-04 2.6E-05 160 2.5E-01 1.6E-03 5.3E-07 4.0E-04 2.6E-05	0 2.5E-01 1.6E-03 5.3E-07 4.0E-02 0 2.5E-01 1.6E-03 5.3E-07 2.0E-02 0 2.5E-01 1.6E-03 5.3E-07 2.0E-03 0 2.5E-01 1.6E-03 5.3E-07 4.0E-03 0 2.5E-01 1.6E-03 5.3E-07 4.0E-03 0 2.5E-01 1.6E-03 5.3E-07 2.0E-03 0 2.5E-01 1.6E-03 5.3E-07 2.0E-03 0 2.5E-01 1.6E-03 5.3E-07 4.0E-04	0 2.5E-01 1.6E-03 5.3E-07 4.0E-02 0 2.5E-01 1.6E-03 5.3E-07 2.0E-02 0 2.5E-01 1.6E-03 5.3E-07 8.0E-03 0 2.5E-01 1.6E-03 5.3E-07 4.0E-03 0 2.5E-01 1.6E-03 5.3E-07 2.0E-03 0 2.5E-01 1.6E-03 5.3E-07 2.0E-03 0 2.5E-01 1.6E-03 5.3E-07 4.0E-04 0 2.5E-01 1.6E-03 5.3E-07 4.0E-04	0 25E-01 1.6E-03 5.3E-07 4.0E-02 2.5E-01 1.6E-03 5.3E-07 2.0E-02 0 2.5E-01 1.6E-03 5.3E-07 4.0E-03 0 2.5E-01 1.6E-03 5.3E-07 4.0E-03 0 2.5E-01 1.6E-03 5.3E-07 2.0E-03 0 2.5E-01 1.6E-03 5.3E-07 4.0E-03 0 2.5E-01 1.6E-03 5.3E-07 4.0E-03 0 2.5E-01 1.6E-03 5.3E-07 4.0E-04
2.5E-01 1.6E-03 2.5E-01 1.6E-03 2.5E-01 1.6E-03 2.5E-01 1.6E-03 2.5E-01 1.6E-03 2.5E-01 1.6E-03	0.25 0.25 1 160 2.5E-01 1.6E-03 0.25 0.25 1 160 2.5E-01 1.6E-03 0.25 0.25 1 160 2.5E-01 1.6E-03 0.25 0.25 1 160 2.5E-01 1.6E-03 0.25 0.25 1 160 2.5E-01 1.6E-03 0.25 0.25 1 160 2.5E-01 1.6E-03 0.25 0.25 1 160 2.5E-01 1.6E-03 0.25 0.25 1 160 2.5E-01 1.6E-03	0.25 0.25 1 160 2.5E-01 1 6E-03 0.25 0.25 1 160 2.5E-01 1 6E-03 0.25 0.25 1 160 2.5E-01 1 6E-03 0.25 0.25 1 160 2.5E-01 1 6E-03 0.25 0.25 1 160 2.5E-01 1 6E-03 0.25 0.25 1 160 2.5E-01 1 6E-03 0.25 0.25 1 160 2.5E-01 1 6E-03 0.25 1 160 2.5E-01 1 6E-03 0.25 1 160 2.5E-01 1 6E-03 0.25 1 160 2.5E-01 1 6E-03 0.25 1 160 2.5E-01 1 6E-03 0.25 1 160 2.5E-01 1 6E-03	0.25 0.25 1 160 2.5E-01 1.6E-03 0.25 0.25 1 160 2.5E-01 1.6E-03 0.25 0.25 1 160 2.5E-01 1.6E-03 0.25 0.25 1 160 2.5E-01 1.6E-03 0.25 0.25 1 160 2.5E-01 1.6E-03 0.25 0.25 1 160 2.5E-01 1.6E-03 0.25 0.25 1 160 2.5E-01 1.6E-03 0.25 0.25 1 160 2.5E-01 1.6E-03 0.25 1 160 2.5E-01 1.6E-03 0.25 1 160 2.5E-01 1.6E-03 0.25 1 160 2.5E-01 1.6E-03 0.25 1 160 2.5E-01 1.6E-03
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0.25 0.25 1 160 25E-01 1.6E-03 5.3E-07 2.0E-02 0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 2.0E-02 0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 4.0E-03 0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 2.0E-03 0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 8.0E-04 0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 4.0E-03	0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 2.0E-02 0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 2.0E-02 0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 8.0E-03 0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 2.0E-03 0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 8.0E-04 0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 8.0E-04 0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 4.0E-04	0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 2.0E-02 0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 2.0E-02 0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 4.0E-03 0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 8.0E-04 0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 4.0E-04 0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 4.0E-04 1 kiadoy irritation. Critical Study, Lewis 1992 1 1.6E-03 5.3E-07 4.0E-04	0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 2.0E-02 0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 2.0E-02 0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 4.0E-03 0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 4.0E-03 0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 4.0E-04 0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 4.0E-04 0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 4.0E-04
0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 8.0E-03 0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 4.0E-03 0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 2.0E-01 0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 8.0E-04 0.25 0.25 1 1.6E-03 5.3E-07 4.0E-04	0.25 0.25 1 160 25E-01 1.6E-03 5.3E-07 8.0E-03 0.25 0.25 1 160 25E-01 1.6E-03 5.3E-07 4.0E-03 0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 4.0E-03 0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 8.0E-04 0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 4.0E-04 0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 4.0E-04	0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 8.0E-03 0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 4.0E-03 0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 4.0E-03 0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 8.0E-04 0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 4.0E-04 iratory irritation. Critical Study, Lewis 1992 1 1.6E-03 5.3E-07 4.0E-04	0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 8.0E-03 0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 4.0E-03 0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 4.0E-03 0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 8.0E-04 0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 4.0E-04 introduction Critical Study, Lewis 1992
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0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 8.0E-04 0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 4.0E-04	0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 8.0E-04 0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 4.0E-04	0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 8.0E-04 0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 4.0E-04 iratory irritation. Critical Study. Lewis 1992 1 160 2.5E-01 1.6E-03 5.3E-07 4.0E-04	0.25 0.26 1 160 2.5E-01 1.6E-03 5.3E-07 8.0E-04 0.25 0.25 1 160 2.5E-01 1.6E-03 5.3E-07 4.0E-04 irratory irritation. Critical Study. Lewis 1992
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Attachment J: Titanium Dioxide Grenades - Juvenile Bald Eagles

Bald eagle juvenile intake for titanium dioxide under Pasquill Category E.

	Distance					Ħ				Daily Chronic Intake
	Œ	Concentration (g/m3)	Int	Intake Rate (m³/day)	ay)	(event/yr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
			Daily IR	Hourly IR	Event IR					
Summer Inhalation										
	100	0.01	3.4E-04	1.4E-05	5.9E-07	48	2	4.5		
	300		3.4E-04	1.4E-05	5.9E-07	48	2	4.5		4.9E-12
	200		3.4E-04		5.9E-07	48	2	4.5		2.0E-12
	700	0.001	3.4E-04	1.4E-05	5.9E-07	48	2	4.5	12775	
	1000		3.4E-04		5.9E-07	48	2	4.5		
	1400	0.0002	3.4E-04	1.4E-05	5.9E-07	48	2	4.5		2.0E-13
	1800	0.0001	3.4E-04	1.4E-05	5.9E-07	48	2	4.5	12775	9.8E-14
										+
	Distance					П				Daily Chronic Intake
	Œ	Concentration (g/m3)	int	Intake Rate (m3/day)	ay)	(event/yr)	ED (yrs)	BW (kg)	AT (days)	Value (g/kg-day)
			Daily IR	Hourly IR	Event IR					
Winter Inhalation										
	\$	0.01	3.4E-04	1.4E-05	5.9E-07	48	2	4.5		
	300	0.005	3.4E-04	1.4E-05	5.9E-07	48	2	4.5		
	200		3.4E-04		5.9E-07	48	2	4.5	12775	5 2.0E-12
	700		3.4E-04	1.4E-05	5.9E-07	48	2	4.5		9.8E-13
	1000	0.0005	3.4E-04		5.9E-07	48	2	4.5		
	1400	0.0002	3.4E-04		5.9E-07	48	2	4.5	5 12775	5 2.0E-13
	1800	0.0001	3.4E-04	1.4E-05	5.9E-07	48	2	4.5	5 12775	5 9.8E-14

Bald eagle juvenile risk characterization for titanium dioxide exposure under Pasquill Category E.

	Distance	Daily Acute Intake Value (g/kg-	Daily Chronic	*Acute Toxicity	**Chronic	Acute TRV	Chronic TRV	Acute	Chronic	Chronic Dose	Acute	Chronic	1—	
	Ê	(g/m³)	day)		(g/m³)	Adjustment	Adjustment	(g/m³)	(a/m²)	(a/ka-dav)	Hazard	Hazard	Acute	Chronic
									†					
Summer Inhalation														
	100	1.0E-02	9.8E-12	0.25	0.25	-	160	2 50 04	4 60 00	70 70 3	4 01 00	10 10 7		
	300	5.0E-03	4.9E-12	0.25	0.25		180	2 55 04	2019	3.3E-07	4.00-02	CO-12.	<u></u>	S
	200	2.0E-03	2.0E-12		0.25	-	100	2 50 04	20-02	3.35-07	2.0E-02	9.45-06	2	2
	700	1.0E-03	9.8E-13		0.25		001	2.50-01	20-10-1	5.3E-0/	8.0E-03	3.7E-06	2	2
	1000	5.0E-04	4 9F-13		30.0	- -	202	2.30-01	30.1	3.3E-U/	4.UE-U3	1.95-05	2	2
	1400	2 0E-04	2 OE-13	20.0	0.20	- -	091	2.5=-01	1.6E-03	5.3E-07	2.0E-03	9.4E-07	S S	S _O
	1800	1 0E-04	2.05-13	0.23	0.20	-	160	2.5E-01	1.6E-03	5.3E-07	8.0E-04	3.7E-07	S	S N
	200	20.2	3.00-14	C7:0	0.25		160	2.5E-01	1.6E-03	5.3E-07	4.0E-04	1.9E-07	2	2
*Acute toxicity value acc	sumed equal to	O Lainordo botanibean	VC Acute cuities of											
ייים בחומים לאניים מייים מייים	מחווכת בלתמו ור	diaglasted cillorite CO	The second second described education of the control of the contro	s are respiratory irrit	tation. Critical Stu	dy: Lewis 1992								
"Chronic critical effects	are respirator	Chronic critical effects are respiratory irritation. Critical Study: Lewis 1992	v: Lewis 1992					<u> </u>				+	+	
												+		
													-	
	100	Daily Acute Intake Vat	Daily Chronic		**Chronic	Acute TRV	Chronic TRV	Acute	Chronic	Chronic Dose	Acute	Chronic		
		(g/m³) (g/m³) (g/kg-	ue Intake Value (g/kg- day)	Yalue (a/m³)	Toxicity Value	Uncertainty	Uncertainty	TRV	TRV į	Adjusted TRV	Hazard	Hazard		Chronic
								//	(111/6)	(g/ng-day)	Manono	duonent	ETTECT	EHect
Winter Inhalation								1					+	
/	130	1.0E-02	9.8E-12	0.25	0.25	-	160	2 SE 04	1 RE 03	5 30 07	4 05	100		1.
	300		4.9E-12	***	0.25	-	160	2 SE-01	1 6F-03	5 3E 07	4.0E-02	0 45 0	2 2	2 -
	200	1	2.0E-12		0.25	-	169	2 SE-01	1 60 03	5.25.07		9.45-00	2	2
	700	1.0E-03) 9.8E-13	0.25	0.25	-	318	2 2 2 2	100	2.35-07	0.00	200	21	21:
	1000		4.9E-13	0.25	0.25		150	2 50 04	1.00-03	3.3E-U/	4.05-03	1.35-00	2	2
	1400	2.0E-04	2.0E-13	0.25	0.25		36	2 50 04	5 5	0.00-07	2.05	9.4E-07	02	0
	1800	1.0E-04	9 RE-14		20.0	-	000	2.3E-01	1.0E-03	3.3E-U/	8.0E-04	3./E-0/	2	2
			10.0		07'0		99	2.5E-01	1.6E-03	5.3E-07	4.0E-04	1.9E-07	운	2
*Acute toxicity value ass	sumed equal to	*Acute toxicity value assumed equal to unadjusted chronic I OAEI	AFI Acute oritical official are	1										!
**Chronic critical effects	are respirator	**Chronic critical effects are respiratory irritation Critical Study. 1 autie 1992	. I extrie 1000	s are respiratory irri	atory irritation. Critical Study: Lewis 1992	dy: Lewis 1992								
	Cim III o	James Cincal Olde	y. Lewis 1352											
harmen and a second														